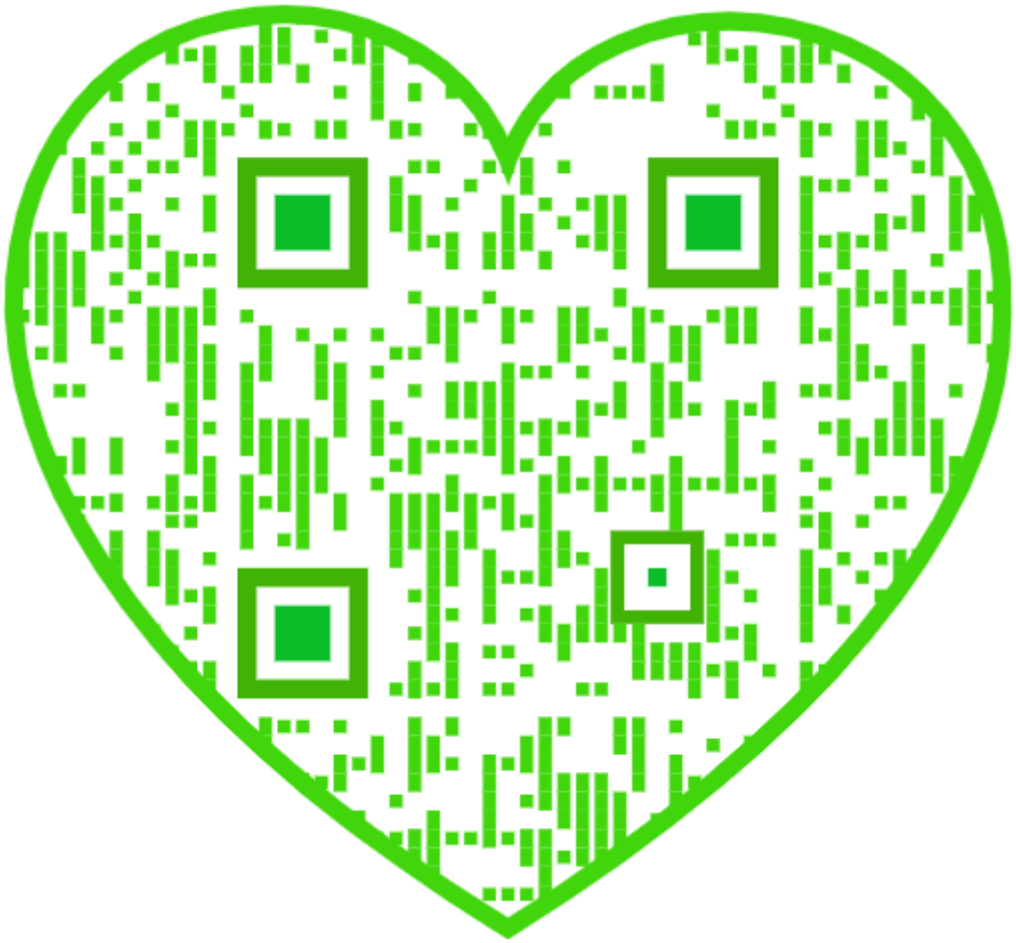

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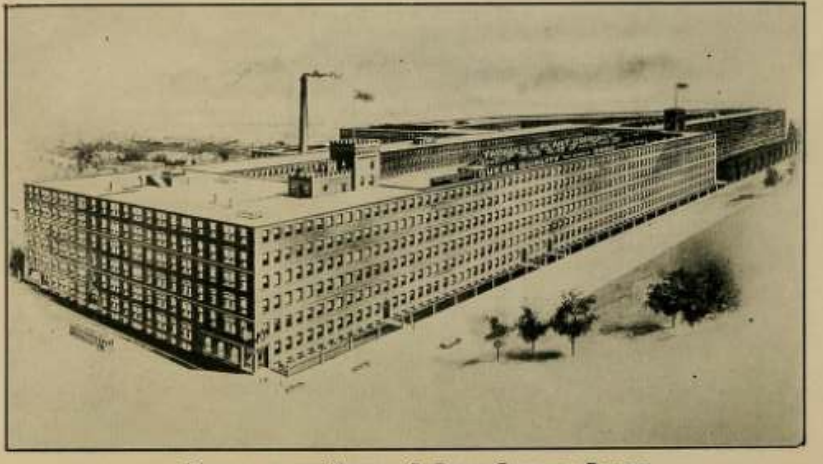

FACTORY OF THE THOMAS G. PLANT COMPANY, BOSTON

The largest factory in the world devoted exclusively to the manufacture of women's shoes.

THE SHOE INDUSTRY

BY

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PREFACE

This book is the story of a great and highly organized industry. It is the result of careful investigation and extensive supplementary study extending over a period of six years. Representative factories, manufacturing all varieties of boots and shoes, have been studied in every department and operation, with an adequate length of time given to each. Information has been secured from manufacturers, officials, department heads, and operatives in every grade of service and from the foremost authorities in the shoe and leather world. The organization of the industry and the processes of shoemaking are herein described as actually observed by the author who began this work as investigator of occupations for the Vocation Bureau of Boston, which has now become the Bureau of Vocational Guidance of Harvard University.

Thus the book has been built up out of the industry itself. All available published material, both domestic and foreign, has been examined, but this volume is unique as an original study. Moreover, the manuscript has been read critically and approved by many authorities in the. industry, both by those who have given information and by others, and by economists and labor union officials.

The conditions and methods presented are those that are general and prevailing in this country.

The great natural divisions of the industry are treated in their

logical order, from its historical setting and the development of shoe machinery to the distribution of the finished product of the factory. Employment conditions

and training in the industry are treated at length and valuable supplementary material is added. Chapters upon shoe repairing and shoe findings are included as these have become divisions of consequence in the great field of shoe manufacture. Important statistical material is given throughout the chapters. An explanation of the terms used in shoemaking is made the final chapter, for consultation by the reader as may be found necessary. Numerous charts and diagrams, and the latest illustrations of buildings, equipment, departments, machinery, methods, social service, and business enterprise are included.

The book graphically presents extensive inside information gathered for permanent use.

It is the purpose of this study to give the nature, history, magnitude, operations and processes, employment opportunities and demands, earnings, and the probable future of the industry, for those already in it, for other persons, and their advisers and teachers, who may be considering employment in this field of manufacture, and for all students of industry.

Thanks are due and heartily accorded to the hundreds of persons in the industry who have freely given information

and suggestion in the course of this study. Grateful acknowledgment is made for special help to the following companies:

The United Shoe Machinery Corporation.

William H. McElwain Company.

Thomas G. Plant Company.

George E. Keith Company.

Endicott Johnson Company.

United Shoe Repairing Machine Company.

Special acknowledgment is here given also to:

Mr. Thomas F. Anderson, Secretary of the New England Shoe and Leather Association, whose generous cooperation and wise counsel have been of great assistance from the beginning.

Mr. Charles T. Cahill and Mr. John B. Hadaway, of the United Shoe Machinery Corporation, who have contributed invaluable information upon shoe machinery. .

Mr. Arthur L. Evans, Editor-in-Chief of the Retail Shoe Salesman's Institute, who has furnished valuable material on the development of shoe machinery.

Mr. W. S. Dennison, Publicity Manager of Rice and Hutchins, Inc., who has contributed a statement upon shoe advertising.

Mr. A. H. Lockwood, Editor of the Shoe and Leather Reporter, who has provided photographs for the illustrations of shoe and leather fair exhibits.

Frederick J. Allen

Harvard University, Cambridge, Massachusetts

January, 1922

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A MODERN SHOE FACTORY

INTRODUCTORY

It is a far step from the ten-by-twelve, one-story shoemaker's shop of the middle of the last century to the great concrete structure which houses the modern shoe factory. True, there are many wooden factories in our older shoe centers, but they were built twenty, or thirty, or forty years ago—before the age of steel and concrete. American shoe manufacturers are now erecting the finest and largest shoe factories in the world, profiting by the developments in building construction in the Old-World and in the New.

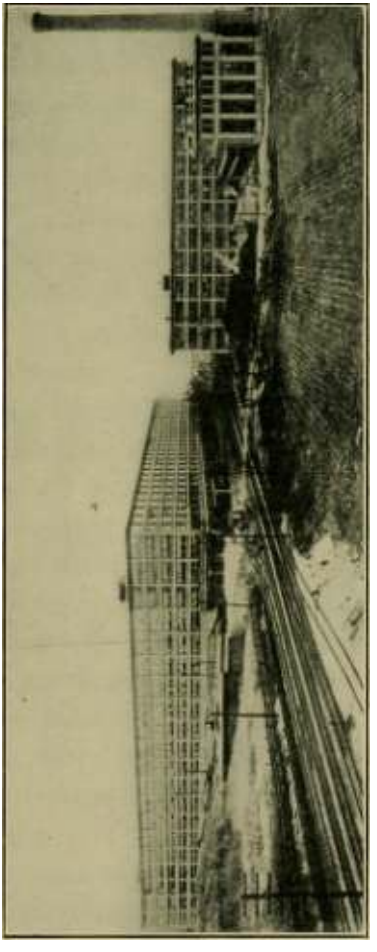
The shoe manufacturer seeks a locality that is accessible by railway, on or near some main line of traffic, that he may bring in his raw materials and distribute the manufactured product with as little cost and delay as possible. It is an advertisement to him to be located in a well-known industrial center. Frequently he is granted exemption from local taxation as an inducement to enter a town.

The securing of workers constitutes the greatest problem of

the manufacturer. He seeks a community out of which he may secure factory em-

ployees, without competing with other industries to his disadvantage in the scale of wages. The older and leading shoe towns, therefore, like Lynn and Brockton, Mass., are essentially one-industry towns. The shoe factory in the large city obtains employees from the great number of industrial workers to be found there, and suffers from the mobility of labor. The factory in the small town or country community draws its workers from the rural districts and profits by the inertia of labor. And the large shoe factory continually attracts operatives who have learned their trade in the smaller factory.

Let us, then, view a typical modern shoe factory in an industrial community. We find it upon a main or spur railway line, and upon one or more public thoroughfares, convenient to traffic and accessible to employees. At the rear of the building is a sizable park, with shade trees, flowers, shrubbery, and settees for employees during rest hours. A club house and athletic field for male employees are among the features which make industrial employment attractive to workmen. All these advantages, with others maintained in the factory itself, contribute to the home feeling and factory pride and spirit of the employees. They create solidarity in factory life. They signify the mutual getting together of employer and worker. They make out of industry a means of social and personal growth.



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Turning to the factory itself, we observe its massive, yet window-covered structure. It consists of a steel frame covered with concrete, the gray garb of modern industry. This building has the typical, standardized form that has been developed in the shoe industry. Light is the most important consideration. The width of the building is limited to about fifty feet, so that there may be plenty of light along the middle of each room. This plan allows ample space for the economic placing of machinery. In this factory no space is lost. Some shoe factories in European countries have but one story with glass roof, so that the light falls clearly upon all parts of the floor, thus necessitating extensive ground space. Our American building, economizing ground space, gets light from the sides, but usually has a special system of windows

in the roof for the benefit of the upper floor.

This typical shoe factory is a single building about three hundred feet long and four stories in height. Sometimes there are wings at the ends of the main building of the same height and width as the main structure. The length varies from two hundred feet up to several hundred and some factory systems are as much as a quarter or half-mile long. Such large plants employ four or five thousand people, and turn out fifteen to twenty thousand pairs of shoes a day. Some large factories have seven or eight floors, but

usually because of lack of ground space or because of having been built before the standard plan was fixed.

The power plant is installed in a one-story building on one side of the factory. Steam is generally used to generate power and furnish heat, and electricity for lighting purposes. In some factories electricity furnishes the motive power also. This building is equipped with an automatic alarm, freight and passenger elevators, stairways, and fire escapes. It has an extensive locker system, and the latest sanitary equipment throughout. An exhaust fan system is used to draw the dust and dirt from the abrasive and trimming machines used in the different departments. This dust material is conveyed to a receptacle near the power house, where it is burned in the furnace.

The four-floor system of the factory is found to be the most

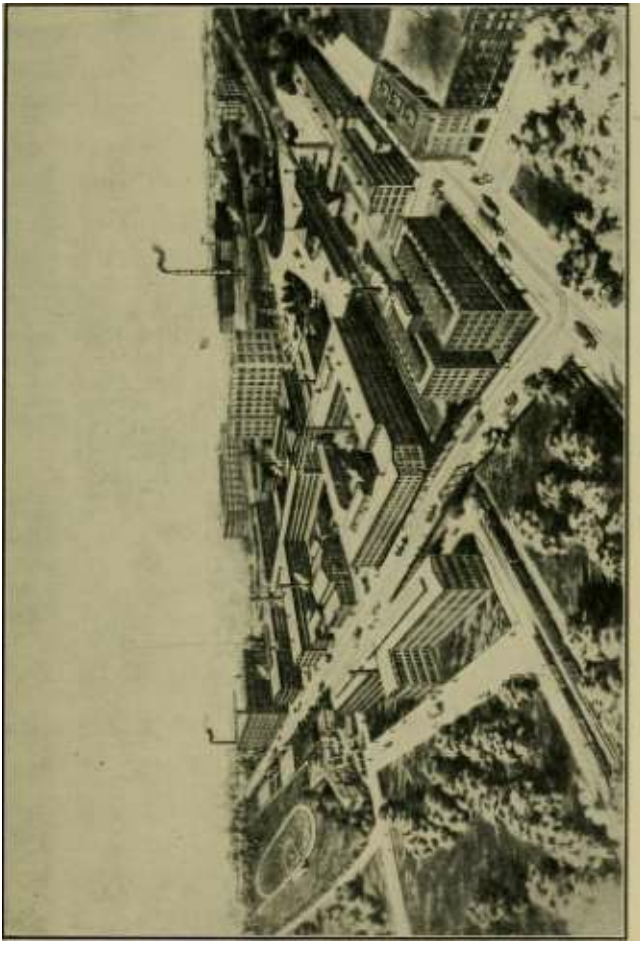
convenient for the sequence of processes in manufacture. The four floors provide space for six major departments of manufacture and for the business offices. The sole leather department, which prepares the bottom parts of the shoe, occupies the first or basement floor. The upper leather and stitching departments occupy the fourth or upper floor, where it is always possible to obtain plenty of light. In these departments the leather upper parts and linings of the shoe are cut and sewed together

and made ready for attaching the bottom. The making or bottoming department uses most of the third floor. Here the sole leather parts and leather tops and linings are brought together and the shoe is made ready for finishing. The finishing, packing, and shipping departments are upon the second floor. All of these divisions of the factory are described at length in the chapters which follow. The business offices are usually divided between the second and third floors, while the factory offices are associated with factory rooms when possible.

A very large shoe manufacturing company may have a system of buildings grouped about a common center, which may be a separate administration building or the oldest or main factory building. In such a system the sole leather department usually occupies an entire building, preparing sole leather parts for the other manufacturing departments. Another building is usually given up entirely to making men's shoes, another to women's shoes, and so on, according to the special lines

followed by the concern. There may also be a box factory, saw mill, printing plant, or other subsidiary department attached to the group of buildings. In some cases a large concern has central offices, or a central factory, in one locality, and the separate factories in other localities.

It remains to speak of the neighborhood of the



Plant of Geo. E. Keith Company, Brockton, Mass.
A system of separate factories.

shoe manufacturing plant. This neighborhood tends to become a factory community, as time passes. Shoe operatives with families wish to live near their work, and frequently several members of a family work in the same factory. Car fares then become an item of importance. The family accordingly lives near enough to the factory to walk back and forth and to come home for lunch at noon time. On

the other hand the manufacturer prefers to hire those who live near by ; as they can the better be depended upon to remain steadily and permanently in his employ.

A chart of organization in the shoe industry is here added, to give a glimpse of the activities carried on within the factory.

INTRODUCTORY

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THE SHOE INDUSTRY

CHAPTER I

HISTORICAL SKETCH

Ancient and Mediaeval Shoes. The sandal was the first known form of footwear. It was the universal type among all early peoples, as it is now in all warm countries. Pictures of ancient Egyptian sandal makers of 1495 B - c - have been found in Thebes, showing methods something like those of the modern hand shoemaker who sat upon a low bench or

form and held his work upon his knees. The earliest known form of footwear varied from a strip of leather fastened underneath as a protection from the ground to coverings ornamented with gems and gold. Sandals of papyrus and of leather were in quite general use in ancient times. The Teutonic tribes of the north of Europe wore a leather protection upon the leg below the knee. The Romans adapted this custom by attaching the leg covering to the sandal, at first leaving the toe open and later closing it, thus making a complete boot. Such a boot or shoe was worn throughout the Middle Ages. In this period the shoe became one of the most important and conspicuous articles of dress, and its length varied with the social or political standing of the wearer. Thus a prince wore a shoe thirty

inches long; a baron, one of twenty-four inches; a knight, one of eighteen, and so on.

A Recent Discovery of Ancient Shoes. "The two-thousand-year-old footwear exhibit in the museum of the United Shoe Machinery Corporation, which was recently taken from excavations made on the site of the ancient city of Antinoe, established a.d. 130, impresses the observer with the fact that ancient shoemakers were by no means lacking in skill. In looking at the exhibit, one is amazed to see the modern effects of many of the samples. The shoes are splendidly preserved, and some of the knitted sandals have the appearance of having been given only a few weeks' hard wear. Attempts at ornamentation show rosettes made of

leather, and made up in a variety of designs." x

The London Cordwainers' Company. In the year 1272 King Henry III granted an ordinance which established the Cordwainers' and Cobelers' Company of London, as it was first known, and gave it power to supervise the trade generally "for the relief and advancement of the whole business, and to the end that all frauds and deceits maye hereafter be avoided." While "cordewaner," a word originating from the use of leather coming from Cordova in Spain, was the name used generally for the shoemaker of the time, the term included also

1 From American Shoemaking, for November 7, 1914.

workers in the associated trades, such as leather curriers, tanners, purse and pouch makers, and girdlers. The "cobeler" became later the worker in old leather, or merely the shoe repairer.

The Cordwainers' Company has become simply a guild, but one of the oldest and most honored in the city of London.

Marry, because you have drank with the King, And the King hath so graciously pledged you, You shall no more be called shoemakers; But you and yours, to the world's end, Shall be called the trade of the gentle craft.

— George-a-Greene, Old Play, 1500.

The Moccasin of the American Indian. The American Indian made rawhide leather by simple processes, and sewed pieces of it into a foot covering called a " moccasin." The white men who first came brought shoes from the mother countries and for many years continued to import them; but the pioneers also wore the moccasins of the native, sometimes making them, as well as hunting shirts and leggings, from leather tanned by the Indians.

The First American Shoemakers. The first shoemakers in this country settled in Massachusetts, Thomas Beard and Isaac Rickerman coming to Salem in 1691, and Philip Kertland to Lynn in 1635.

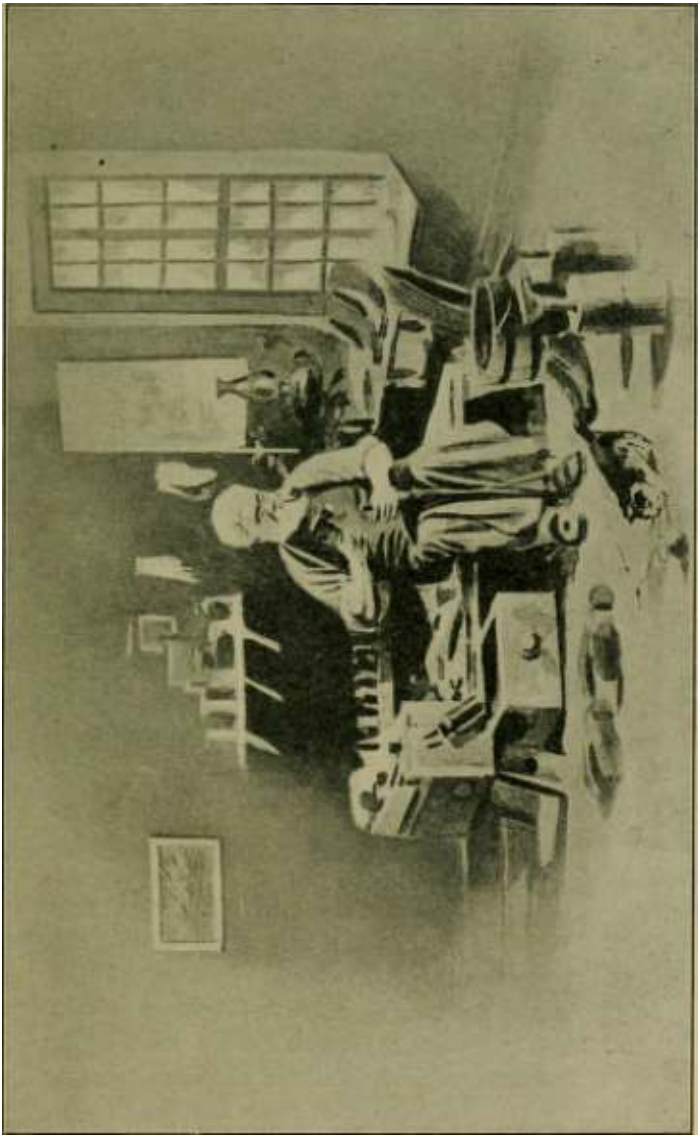
The advent of each of these men was heralded as an important event and special favors were granted to them. They brought the methods of a trade still primitive though ancient in Europe. They used the leather apron, lap stone, hammer, wooden pegs, hand-made thread, boot-tree last, such as thousands of cobblers use even in this day of machinery. John Adam Dagyr, a Welshman, came to Lynn in 1750. He was a master-craftsman, and Lynn, which had already become the leading shoe town in the Colonies, advanced still more rapidly in the industry. Dagyr was the first organizer of the industry in this country. The more ingenious colonists learned to make shoes by hand, often serving an apprenticeship of seven years, and the trade gradually passed far beyond its European stages. From these simple beginnings sprang the great industry of American

shoemaking.

An Indenture Paper. Following is a copy of the original agreement by which boys were apprenticed to the shoemaking trade in the early part of the last century. The original is now in the possession of Mr. Charles Wellesley Allen, Brooklyn, N. Y.

"This Indenture, Witnesseth,

"That John Goedersoon, now aged fourteen years,, eight months and twenty-seven days, by and with the consent of his step-father, John Wright, and his mother,



Mary Wright, hath put himself and, by these presents, doth voluntarily and of his own free will and accord, put himself

Apprentice to Frederick Seely of the City of New York, Cordwainer, and after the manner of an Apprentice to serve from the day of the date hereof for and during, and until the full end of six years, three months and three days next ensuing during all which time the said Apprentice shall his master faithfully serve, his secrets keep, his commands everywhere readily obey.

" He shall do no damage to his said Master nor see it done by others, without letting or giving notice thereof to his said Master. He shall not waste his said Master's goods nor lend unlawfully to any. He shall not contract matrimony within the said term; at Cards, Dice, or any unlawful game he shall not play, whereby his Master may have damages. With his own goods nor the goods of others, without license from his Master. . . . He shall neither buy nor sell. He shall not absent himself, day or night, from his said Master's service without leave, nor haunt ale-houses, taverns or play-houses; but in all things behave as a faithful Apprentice ought to do, during the said term.

" And the said Master shall use the utmost of his endeavors to teach, or cause to be taught or instructed, the said Apprentice in the trade, or mystery, of a Cordwainer, and procure and provide for him sufficient meat, washing, lodging and clothing fit for an Apprentice, during the said term of service and four quarters of night schooling, during the said term.

" And for the true performance of all and singular the Covenants and Agreements aforesaid, the said parties bind themselves each unto the other firmly by these

presents. In Witness Whereof the said parties have interchangeably set their hands and seals hereunto. Dated the sixth day of August, in the thirty-fifth year of the Independence of the United States of America, and in the year of our Lord eighteen hundred and eleven.

" Sealed and delivered in the presence of L. Cowdrey.

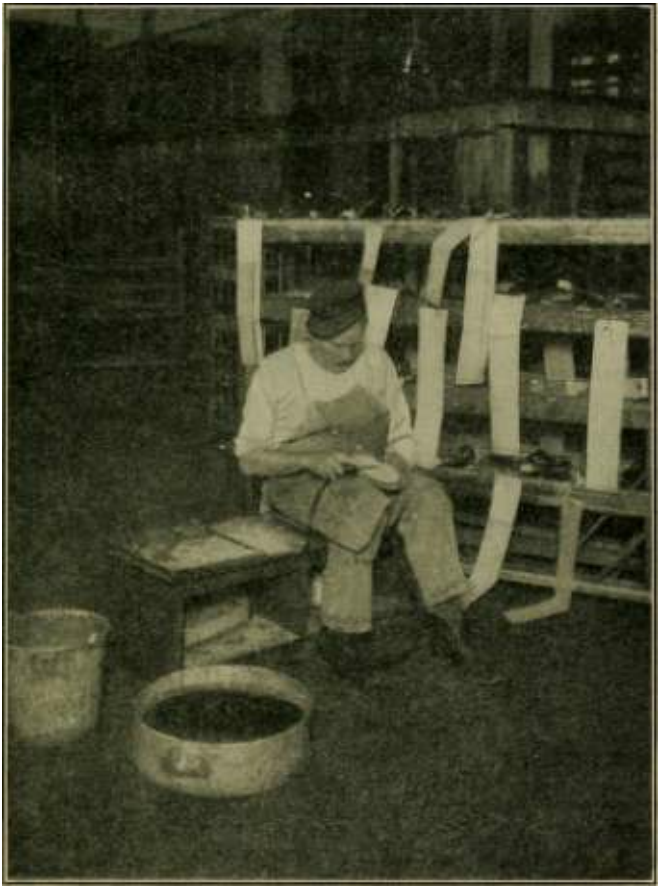
" Frederick Seely, " John Goedersoon, " Maria Wright, " Jahan Wright."

The Value of Shoes in Colonial Times. In spite of the abundance of wild and domestic animals whose skins might serve as leather in Colonial times, the prices of leather and of rough hand-made footwear were comparatively high. Leather of the finer sort was still imported from England. Shoes were the product of quite laborious processes and of considerable skill and ingenuity. They might be purchased by labor on the land or in the forest, by the barter of other goods or by hard English shillings. In the law of 1720-21 Pennsylvania fixed the maximum price at which shoes should be sold at retail in the colony, as " six shillings and six pence for a pair of good, well-made men's shoes," five shillings for women's shoes, and proportionately less for children's shoes. This law fixed the price of leather also.

With many persons, especially children and youth, shoes were little or seldom worn, appearing only on special occasions. Often the Colonial family walked bare-foot to church on Sunday morning, each member carrying his shoes in his hand until near the church door when they were put on the feet.

Ancient Shoe Laws. The law makers of the Colonies from the beginning set regulations over the activities and employments of the people. The Province of Pennsylvania in 1720-21 made it a crime for a tanner of leather to become a currier or a shoemaker. Section 7 of the law reads as follows:

" And be it further enacted by the authority aforesaid that no person occupying or using the mystery of the shoemaker, shall make or cause to be made any boots, shoes, or slippers for sale but of leather well and sufficiently sewed with good thread well twisted and made and well waxed. Nor shall mingle the over-leather, that is to say part of the overleather being of neats leather and part of calves leather. Nor shall put into any boots, shoes, or slippers for sale, any leather made of sheepskin, . bulls hide, or horses hide; or into the upper leather of any shoes or slippers, or into the inner part of any boots (inner part of the shoe excepted) any part of any hide from which the sole leather is cut, called the neck, shank, flange, powle, or cheek, upon paying a forfeiture of all such shoes, boots, and slippers, to be divided and applied in the manner directed by this act."



The Hand Worker in the Modern Factory, Repairing Shoes Injured in Passage Through Factory Processes

The same Act provided that shoes sold above the prices

fixed by Provincial law or above the rates set from time to time by the mayor, alderman, and justices of the courts, should be subject to forfeiture.

The Itinerant Shoemaker. The Colonial shoemaker often traveled from house to house or village to village, as a journeyman, doing repair work and making new shoes for all the members of a family. The market for home-made shoes was limited in those days, and many of the shoemakers practiced other arts, such as sharpening knives, saws, and axes, mending furniture, repairing clocks, cutting hair, and pulling teeth. The traveling cobbler, with his kit of simple tools and with the rough and heavy leather of the period, was a welcome dispenser of service and of news and gossip among the colonists.

The First Shoe Shops. No change of importance from either home work or itinerant employment occurred in shoemaking in the colonies until about the middle of the eighteenth century, when the more enterprising cobblers began to employ others and work became more and more confined to local shops. Hand processes continued, with some sub-division of labor, one man cutting, another sewing, another fastening on the bottom of the boot with pegs, and so on. Often in the home or little shop the hand

sewing was done by girls and women whose hands were more deft for such a process.

Poor lone Hannah, Sitting at the window, binding shoes!

Faded, wrinkled, Sitting, stitching, in a mournful muse!

Bright-eyed beauty once was she,

When the bloom was on the tree.

Spring and winter Hannah's at the window, binding shoes.
—" Hannah Binding Shoes," Lucy Larcom.

The New England shoemakers led in the industry. There were a few Dutch shoemakers in New York, but scarcely any in the agricultural communities of the South. The market of the New England maker, therefore, included all the colonies scattered along the Atlantic coast. In many cases the proprietor of the shop made weekly or monthly trips on foot or with an ox-cart to a village or larger community to dispose of his shop-made goods, and shoe traffic gradually arose.

Often the shop was closed altogether in the summer, when work upon the land was necessary or fishing for those situated along the sea coast.

Frequently the home served as a shop ; the family receiving shoe materials from the manufacturer or from the village storekeeper who acted for the manufacturer or tanner.

A Shop of a Century Ago. " Probably the oldest shoe factory

now standing in this country is the Putnam shop, near the Newburyport turnpike, in the town of Danvers, Mass. It was built before the Revolution. It was one of the buildings on the old Putnam farm, the birthplace of General Putnam (" Old Put ") of Revolutionary fame. It was mentioned in the first United States census of manufacturing, taken in 1786, and it was then evidently a factory of importance. It is still in excellent state of preservation. Some of the tools that were used by its occupants are still preserved.

" The early tools are of wrought iron. The patterns are of board. Cutters who are used to handling thin patterns of today would think these board patterns very coarse. Lasts saved in the old shop are clumsy. The books show that they cost from twenty-five cents to one dollar a pair, the price being determined by the style. Apparently, the lastmakers of old well knew how to capitalize style.

" All the shoes made in this old shop were made by hand. The shoemakers were paid from fifteen to twenty-five cents a pair for their labor, and they earned from five dollars to ten dollars a week, the rise and fall of their wages being determined chiefly by the way the orders came in. At first shoes made in this shop were sent in ox-wagons to Boston.

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Later they were sent in horse wagons. They were packed in barrels." x

Ebenezer Breed and the Shoe Tariff. Following the Revolution the break between the Colonies and the Mother Country encouraged American industries in many lines. American shoemaking, however, still suffered from the competition of imported shoes. The habit of wearing English-made shoes was hard to break and many of the well-to-do people continued to demand them.

At this crisis, in which an industry of great possibilities seemed likely to be restricted and confined mainly to the cheaper lines of product, appeared the first great leader of American shoe manufacture, Ebenezer Breed. Breed was born in Lynn, of Quaker parentage, and here learned the shoe trade. While still a young man he removed to Philadelphia, then the Nation's capital. Here he gained the friendship of prominent people, including members of the National Congress. He proposed a protective tariff on boots and shoes, and on this suggestion Congress passed a shoe tariff act in 1789.

Breed was a wholesale boot and shoe merchant, and prospered greatly after the passage of the act. He was recognized as a leading American and was feted at home and abroad, visiting France and England.

1 From Boot and Shoe Recorder, Boston.

Through misfortune in personal affairs, Ebenezer Breed lost his business and property and his eyesight. He died in the almshouse of his native town of Lynn.

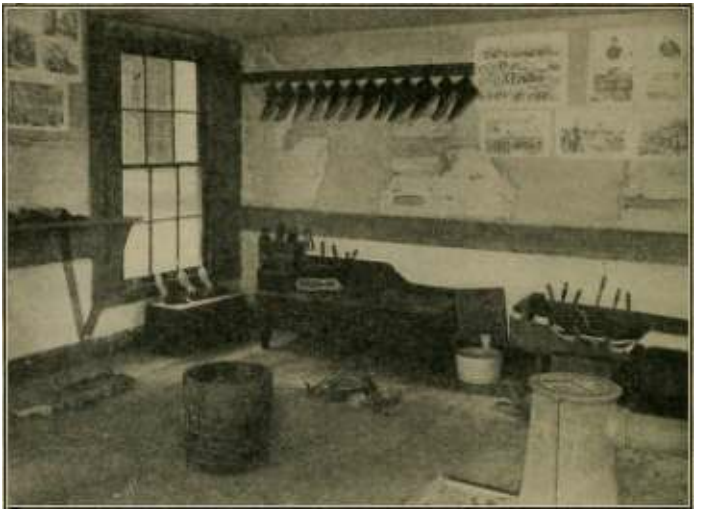
The following has been said of him:

" The man who was so powerful as to build up a great wall of protection about the entire American shoe trade spent his declining days quietly and peacefully in an almshouse, forgotten by nearly everyone but the Quakers."

The First Shoe Factories. Soon after the Revolution shoemakers who wished to increase their output or had ambition to become manufacturers or employers, engaged other shoemakers to work for them on a larger scale than formerly, thus establishing the factory system and introducing a distinction between capital and labor in the industry.

The early manufacturers devoted themselves more and more to buying materials in quantities and to selling the products of their factories. Larger and larger factories were erected. In many cases shoemakers took materials from the factory and made shoes at home, each in his little shop.

A Division of Labor in the Factory: " Teams" and " Gangs." It was known that workmen were usually expert in particular operations, for instance, in cutting and fitting uppers, or in preparing soles, or in sewing the sole to the upper. This fact pro-



Interior of a Shop in the Civil War Period

A Modern Interior

duced a division of labor. Shoemaking in factories during this period, until the introduction of machinery, was marked, also, by the custom of having what were called " teams " of workers. A team consisted of a number of. workers, each performing a particular process, the whole team producing an entire shoe. On the other hand, a team might consist of a group of men all experts upon a single process. Such a team was known usually as a " gang." A gang of bottomers, for instance, often went from factory to factory, or from employer to employer, having a contract with each to bottom all the shoes in process of making.

The team or gang system gradually passed largely out of use after the introduction of shoe machinery. The term is still used in some factories, especially in the making or bottoming room. In one factory only, however, among the many investigated in obtaining material for this book, was there found a gang working as in earlier times. This was a team of six men making an entire shoe of high quality for a fine class of trade.

A Quotation on the " Contract System." The following quotation gives an interesting picture of the contract system and team work: 1

" With the advent of the McKay machine came new methods, new systems, and new styles.

1 G. P. Lawrence, in American Shoemaking, Boston, January

16, 1915.

" The contract system was the popular way of making shoes. The manufacturer had a room in the shoe district, where he cut the uppers and kept his stock; he would then enter into a contract with some man to fit them. When uppers were fitted he would again make another contract with some other firm to bottom them. Thus it will be seen that little equipment was needed to manufacture shoes. All the room required was for cutting and packing. Our large and modern factories of today, with their splendid equipment of almost humanly intelligent machinery and skilled operators, giving employment to thousands of men and women, and turning out annually 3,000,000 pairs of shoes, was never the dream of the old-time shoemaker.

" Many evils grew from the contract system. It was a common thing for those men who had charge of the contract fitting and bottoming rooms to underbid each other, and he whose bid was lowest got the work. He saw to it, however, that his margin of profit remained the same, for he would cut the piece price of his employees enough to make up the difference, and thus his margin of profits remained the same.

" Labor organizations did much to correct this evil.

" Prices for bottoming ranged from twenty-seven and one-half to forty-five cents a pair. Contractors wanted the lion's share for their profit, and got it.

" The MacKay sewing machine and a few stock fifing machines were all the machines used at the time of the five-handed team, and they were operated by foot power.

" Stock fitting was a simple operation, consisting of rounding and channeling and counter skiving (no mould-

ing). Five men were required to build a shoe. A bench six feet long and four feet wide, with two shelves in the center, two men on each side and one at the end, a laster, beater-out, trimmer, edge setter and bottom finisher, constituted the team, and twelve pairs of lasts were given to each team."

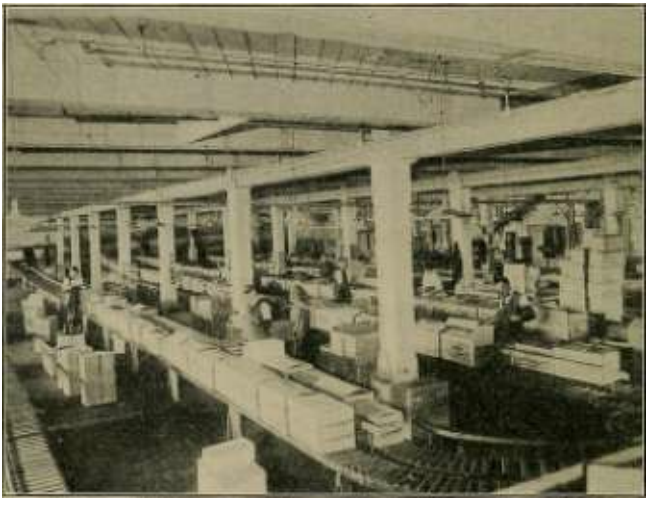
The Attitude of Early Shoemakers towards the Shoe Factory. The typical shoemaker had long been his own master. He worked in his little shop at home as he pleased, doing perhaps farm work or engaging in some other occupation a part of the year. He objected to serving any other master than himself, and believed that obedience to a foreman was a surrender of his personal rights and liberties. He was reluctant to submit to factory hours, from seven o'clock in the morning until six at night, and to exacting factory regulations. He opposed in like manner the introduction of labor-saving machinery.

The general industrial growth of communities was, however, an irresistible though a slowly coming tide. Progressive methods of employment and the introduction of machinery gradually broke down all opposition. The individual

shoemaker or cobbler has survived to the present day, but will probably disappear with this generation.

Organization in the Factory System. Factories were divided into the natural divisions or departments of shoemaking. Men were set apart to

organize and train employees. Superintendents and foremen or overseers of departments appeared. Systems were worked out for the procuring and care of raw materials, for making shoes in quantity, for moving them in the processes of making from one



Shipping Room of Endicott, Johnson and Company, Endicott, N. Y., from which go out daily twelve carloads, or

113,000 pairs of shoes, the largest output of any factory in the world.

factory room to another, for having each lot handled and finished as a unit, and for disposing of factory product through agencies established in market centers, and through traveling salesmen. Thus factory organization produced also business organization.

Specialists. Modern factory and business organization calls for specialists in each department.

The large shoe manufacturing firm of today has a specialist in leather buying, another in procuring lasts and patterns, another in charge of miscellaneous supplies, another as manager of sales, another as factory manager or in charge of a factory department, another as financier, another for advertising, and so on through all the great divisions of the firm's activities.

The Magnitude of the Industry Today. The growth of the shoe industry in this country has been marvelous. The greatest gain has taken place within the last twenty-five years, since the invention and wide-spread use of the more important shoe-machines. New and larger factories than were formerly known have been built in the East, and shoe manufacture has been carried into virgin territory in the West. There was great expansion in the leather industries in the western states in the years from 1904 to 1909. This was a " boom " period,

with consequent overproduction, retrenchment, and readjustment following up to 1914. While in some cases men with ample capital have established large factories, in many other cases shoe workers have opened up small factories of their own.

Although full statistical information is given in the census tables included in this volume, a few illustrative figures and facts may be presented here. According to the Census of Manufactures, 1914,

there were in thirty-one states of the Union 1,964 factories making shoes and allied products. The capital invested in the industry was $297,648,941, 1/ and the number of employees was 227,605. Eight hundred and eighty-four of the factories were in Massachusetts. There has been a constant increase in the industry since that time, especially in invested capital and employees. The persons connected with shoe manufacture probably now number more than 250,000. The leading states in their order are, Massachusetts, New York, Missouri, New Hampshire, Ohio, Pennsylvania, and Maine.

Boston is the leading center of the world in the shoe and leather trade; Chicago, in trade in un-tanned hides.

Brockton, Mass., now ranks first in the industry, with eighty-six per cent of its manufactures in shoes. It has seventy-five factories, which are mainly large modern structures, and produces shoes worth $40,000,000 annually.

Lynn, the first home of the industry in this country, was long the leading city in the manufacture of shoes and shoe material. Sixty-five per cent of the manufactures of the city are in these lines. It has over two hundred shoe factories, some of which are the smaller, wooden buildings of an earlier period and others entirely modern, and produces goods to the value of $30,000,000 or more annually.

Lynn still leads in the production of women's shoes, in normal times.

Other important shoe cities in the order of magnitude of manufacture are Haverhill, Mass., New York, St. Louis, Mo., Cincinnati, Rochester, N. Y., Boston, Manchester, N. H., Milwaukee, Wis., Chicago, 111., and Auburn, Me.

The exportation of shoes has come mostly within the last fifteen years, and has grown very rapidly within this time. The Massachusetts North Shore district, for example, was sending abroad more than ten million dollars' worth of shoes annually at the opening of the World War.

The United States is not only leading the world in making shoes, but is finding markets increasingly in all countries.

The New England Shoe and Leather Association has recently issued a circular from which the following statements are drawn:

New England produces fifty-seven per cent of the boots, shoes, slippers and cut stock and findings, and a large percentage of all the leather made in this country.

It has 1,000 shoe factories and cut stock and findings establishments, principally in Massachusetts, New Hampshire, and Maine.

In these industries $111,000,000 capital is invested, 100,000 wage-earners are employed, and

the annual value of product is approximately $300,000,000.

It has about 175 establishments for the production of leather, representing $45,000,000 of invested capital and $45,000,000 annual value of product.

It also leads in the manufacture of rubber goods, Massachusetts alone annually producing $50,000,000 worth of rubber boots and shoes and miscellaneous articles.

Massachusetts is virtually the birthplace of the tanning and boot and shoe industries of the United States, and has possessed these allied industries for nearly three hundred years.

In the boot and shoe and cut stock and findings industries, it has about 875 establishments, with more than $90,000,000 invested capital, 83,000 wage-earners and annual value of product of $236,000,000.

It has sixty-three cities and towns in which the shoe manufacturing industry is carried on.

It has one county, Essex, which produces one-seventh of the combined boot and shoe and leather product of the United States.

Brockton, the leading city in which men's shoes are manufactured; Haverhill, the foremost slipper-manufacturing city, and Lynn, the world's greatest women's footwear center, are notable examples of Massachusetts' shoemaking activity.

More than 3,000,000,000 pairs of shoes have been shipped from Boston in the past forty-five years.

Shoe and Leather Fairs. In recent years many shoe and leather fairs, or expositions, and style shows have been held in the cities which are the centers of the shoe and leather industries. These fairs were at first managed in some instances by individuals and firms; but are now being conducted generally by the great local shoe and leather associations of the country. The following paragraphs, taken from the Shoe and Leather Reporter, Boston, tell of the success of the first nation-wide fair yet held in the United States, conducted under the auspices of the New England Shoe and Leather Association:

The first National Shoe and Leather Exposition, held under

the co-operative system, is admitted by everyone to be an unqualified success. The spaces offered for sale were all taken and many firms were unable to participate but will not be excluded a year hence. From the inception of the idea of a permanent annual exhibition it was fairly well understood that a successful fair could be held every year. The vision of the projectors of this enterprise has come true and they have cause to feel proud and satisfied.

Our industry is rich in patriotic, public-spirited men who are willing to work early and late to promote movements for the benefit of all departments of the trade. It is no easy task to organize a big fair and carry out the details to the liking of all of the participants.

There does not seem to be any opinion other than that the exposition of 1920 has established the precedent for an annual fair to be held in Boston. As year follows year this annual event will increase in interest, importance, and benefit, and will become a still more vital factor in the merchandising of shoes and leather.

The experiences of our trade during the war have taught us the impressive lesson that as an industry we must stand together. No firm or corporation is strong enough to ignore its competitors. The obvious moral of the times is that we must meet and confer and cooperate more frequently in the future than we have in the past.

The concluding paragraph is from an article in the same issue by Mr. Frank R. Briggs, President of the National Shoe and Leather Exposition:

Perhaps the dominating function of this exposition is the opportunity for competitive comparisons of leathers and shoes, prices, quality, and materials, with the resultant knowledge all in favor of the ultimate consumer. Certainly the showing of three hundred lines of merchandise all in intensive competition bespeaks a real advantage to the public.

The following material upon shoe advertising was prepared expressly for this volume by Mr. W. G. Dennison, Publicity Manager for Rice and Hutchins, Inc., Boston.

The Development of Advertising in the Shoe Industry. In 1866, John H. Hanan, then a youth

of seventeen, was taken into partnership with James Hanan, his father, an expert on leather and in shoe-making.

Young Hanan entered enthusiastically into the selling of the output of their small factory and it was due to his initiative that the first shoe advertising of a national character was done. Meeting with dismal failure in an attempt to sell his shoes in the Middle West, he realized that the one thing lacking was a reputation for his merchandise.

In spite of strong opposition from his father, he decided that every Hanan shoe should be stamped Hanan and thus paved the way for named or trade-marked shoes the advertising of which in publications with national circulation quickly followed.

James Means, Wm. L. Douglas, and J. B. Lewis were among the pioneer advertisers with men's shoes selling at $3.00 and $3.50.

Shoemaking in those days was crude compared with the precise methods brought about by the introduction in later years of shoemaking machines that seem to do everything but talk.

Quality for quality the shoes of those days compare splendidly with today's productions and it was not long before the adventurous advertisers were doing a volume business.

With the perfection of shoemaking machinery and the introduction of more and more labor-saving de-

vices, the capacity of factories was greatly increased and incentive furnished to more manufacturers to advertise.

Shoe advertising, as done in the late sixties, bears little if any resemblance to modern achievements, the art of illustration being limited to rather crude wood cuts while the

typographical effects were about as interesting as a legal notice.

Keen competition brought about a higher standard of illustration, the introduction of the use of figures and more thought in the selection and use of types. Meanwhile, experiments conducted by photographers, engravers, and printers resulted in the invention later known as the half-tone, the perfection of which has made possible the realistic representation of shoes with which the pages of all classes of publications are enlivened.

No figures are available to show the extent or cost of advertising done by Hanan or those manufacturers who immediately followed his lead and while the amounts must have seemed large in those days, an appropriation for a year's advertising then would scarcely pay for one page in some of our modern magazines.

The earliest figures carry back but a few years and show that in 1914 there was spent in national publications $307,417. One national publication in 1914 had six shoe advertisers; in 1920 it had sixteen

such accounts. In 1914 this same publication billed $85,176; in 1920 one advertiser spent more than the total of the 1914 advertisers while the total of shoe advertisements in this publication amounted to $671,500.

Figures to show the cost of shoe advertising in 1920 are not compiled and for 1919 there are only exact statistics covering certain phases of shoe advertising but a fairly accurate approximation may be arrived at on the basis of certain known percentages; $1,768,495 was spent for shoe advertising in 1919 in seventy-two national publications and since this bears a given ratio to the total spent in these magazines for advertising of all kinds, it may be safely assumed that the same ratio applies to the total expenditures for all kinds of advertising in newspapers, direct, trade papers, novelties, electric and painted signs, farm papers without national circulation, demonstrating, window display, bill posting, street cars, programs, and motion pictures.

The ratio established in magazine advertising gives a total of $20,525,400 for all the forms listed in the preceding paragraph .and this brings the whole amount up to $22,293,895, a very respectable amount.

The foregoing figures show the part in the annual expenditures for advertising taken by the shoe industry to be of such magnitude as to readily indicate

its important position with regard to the country's industries.

Shoe and Leather and Allied Associations. The shoe industry and its associated lines of activity have organized notable associations for trade and business promotion, both nationally and locally. The following list includes the

country-wide organizations. In most cases the officers of these bodies are widely scattered, and the address of the secretary is given as the headquarters of the organization.

National Shoe and Leather Associations : National Boot and Shoe Manufacturers' Association of

the United States, Boston. National Leather and Shoe Finders' Association, 878

Arcade Building, St. Louis. National Association of Importers of Hides and Skins,

41 Park Row, New York. National Hide Dealers' Association, Chicago. National Shoe Wholesalers' Association of the United

States, 127 Duane St., New York. National Shoe Retailers' Association of the United States

of America, Philadelphia. National Shoe Travelers' Association, 207 Essex St.

Boston. National Association of Superintendents and Foremen,

207 Essex St., Boston.

There are local associations, similar in nature to those in the list, in all the great shoe and leather centers of the United

States, as, for example:

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The New England Shoe and Leather Association,

166 Essex St., Boston. The New England Leather and Shoe Finders' Association,

14 Albany St., Boston. Boston Boot and Shoe Club, 166 Essex St., Boston.

The following diagram, taken from the United States Census of Manufacturers for 1914, shows graphically the value of products reported for the most important states in the industry in 1914 and 1909.

Boots and Shoes — Value of Products for Leading States: 1914 and 1909

Table 1 shows the value of products for 1914, 1909, and 1904 for the 12 leading cities, each reporting products in 1914 valued at over $10,000,000, ranked according to value of products in 1914.

THE SHOE INDUSTRY

Table I. * Summary for Leading Cities: 1914, 1909, and

1904

1 Figures can not be shown without disclosing individual operations.

* U. S. Census of Manufactures, 1914: The Leather Industry, Table 29.

Scope of the Shoe Industry. The boot and shoe industry includes factories manufacturing boots, shoes, and slippers, moccasins, leggings, overgaiters, etc., and also establishments performing only special operations on materials largely furnished, such as stitching, crimping, making buttonholes, and other processes constituting the work done. There were 1,355 establishments in the industry in 1914, and 1,248 of these were reported as making complete boots and shoes; 53 made, primarily, overgaiters, moccasins and leggings, and 54 performed some process on contract, largely on materials furnished. The amount paid for this work is a part of the $501,760,458 reported as the value of the products of the boot and shoe industry.

HISTORICAL SKETCH

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Comparison with Earlier Censuses. Table II summarizes the statistics of establishments engaged in the manufacture of boots and shoes for each census from 1879 to 1914, inclusive, and gives the percentages of increase from census to census.

Scope of the Boot and Shoe Cut Stock Industry. Establishments under this classification are engaged primarily in the manufacture of soles, top lifts, heels, tips, inner soles, and similar articles used in making shoes. At the census of 1909 statistics for this industry were combined with those for the manufacture of boots and shoes and boot and shoe findings.

Comparison with Earlier Censuses. Table III summarizes the statistics of the establishments engaged in the manufacture of boot and shoe cut stock for each census from 1879 to 1914 and gives percentage of increase.

The condition of this industry depends largely upon the extent to which the articles are manufactured in the boot and shoe factories. The value of the products, however, has increased steadily during the period covered by Table III. There has also been an increase in the cost of materials, the number of wage earners employed, and the wages paid during each period since 1879, except between 1899 and 1904, when there was a slight decrease in the number of wage earners.

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In addition to the product covered by the table, there was $2,076,236 reported in 1914 as the value of boot and shoe cut stock manufactured as a subsidiary product by

establishments engaged primarily in other industries.

Table IV shows export trade under the normal conditions immediately preceding the World War. It is of especial value, also, as showing the countries to which American manufacturers of footwear have sent their products. Our export trade in footwear has, however, greatly increased in the years following the war, as indicated by the following table taken from the Shoe and Leather Reporter, Boston, of July 8, 1920, and presenting official government information. This great export business is to be explained chiefly by the enterprise of American shoe manufacturers in securing large foreign sales and contracts, by the partially crippled condition of the shoe industry in foreign countries as a result of the war, by lessening competition in some countries outside of the theatre of the war, and by the fundamental efficiency of the shoe industry in this country. This efficiency arises from the skill of our manufacturers in perfecting business and factory organization, the standardization of shoe machinery, and the superiority of the American shoe worker.

THE SHOE INDUSTRY

Table V. Total Exports or Shoes from the United States for the Month of May 1920 and 1919, and for Eleven-Month Periods Ending with May, 1920, 1919, and 1918.

Exports of Children's Shoes

Period Pairs Dollars

May, 1920 758,447 3,629,750

May, 1919 411,952 754,i5o

11 months, 1920 3,254,859 5,986,638

11 months, 1919 3,127,930 4,729,614

11 months, 1918 3,526,802 4,176,180

Exports of Men's Shoes

Period Pairs Dollars

May, 1920 758,447 3,629,750

May, 1919 727,573 2,896,855

11 months, 1920 9,753452 44,567,102

11 months, 1919 6,699,958 2.6,011,280

11 months, 1918 6,464,603 21,158,048

Exports of Women's Shoes

Period Pairs Dollars

May, 1920 681,180 2,608,156

May, 1919 442,901 i,24i,735

11 months, 1920 5,472,078 19,923,642

11 months, 1919 4,618,374 11,743,804

11 months, 1918 3,948,901 8,511,340

Total Exports of Shoes

Period Pairs Dollars

May, 1920 1,878,535 7,035,752

May, 1919 1,582,426 4,892,740

11 months, 1920 18,480,389 70,477,382

11 months, 1919 14,446,262 ■ 42,484,698

11 months, 1918 13,940,306 33,845,568

CHAPTER II SHOE MACHINERY

The Invention of Shoe Machinery. The invention of shoe machinery, from about the middle of the last century, has revolutionized shoe manufacture. The story of the patient development of one machine after another, until the dexterity of the human fingers has been equalled, reads like a romance. Most of these machines have been invented by

shoeworkers themselves, often after long toil and study of particular processes. Inventive genius and mechanical skill have been granted about 7,000 patents on shoe machinery since the establishment of the United States Patent Office in 1836. Sometimes there have been a score or more on a single machine, to protect it as it has been built up part by part. New patents are constantly being granted, nineteen being announced in one week during the preparation of this chapter.

In making an ordinary shoe today there are one hundred and seventy-four machine operations, performed upon one hundred and fifty-four different machines, and thirty-six hand operations, or altogether two hundred and ten processes. About three

hundred different machines are used in the manufacture of all kinds of footwear, and the number of processes is considerably increased.

Operating the Rex Pulling-Over Machine, the most wonderful of shoe machines

Three Stages of Development. There are three conspicuous stages of development in the invention and use of shoe machinery.

The first stage is that of the upper-stitching machine, by which the top parts of the shoe are machine-sewed instead of being sewed by hand.

The second is that of the sole-sewing machine,

by which the soles are attached to the uppers with a machine instead of by hand.

The third stage is that of machine-welting, in its modern form. This is an improved method of sewing on the sole, so that the sole is flexible, as was the old hand-sewed shoe.

Other machines are subordinate to these in general importance, and mark steps of advancement in minor processes and features of shoe manufacture.

An account of the more important machines used in shoe manufacture is given herewith, in the order of their invention. As we shall meet these in operation in our study of factory departments, some knowledge of each machine will help our understanding of a process and of the running of the machine as an occupation.

The Wooden Peg: 1815. Heels were fastened to shoes by hand-made wooden pegs as early as the sixteenth century. Preceding the use of shoe machines came the machine-made peg in 1815. Up to that time the bottom of the shoe had been fastened to the upper by sewing with heavy thread or " waxed ends," and in the case of some heavy boots by copper nails. This sewing was a slow, hard process and was necessarily done by men. The invention of the shoe peg was a great gain. The first pegs were whittled out by hand in imitation of the nail.

When pegs were properly driven, piercing both the outer and inner sole, with the upper leather well drawn in between the two, the result was a great improvement in strength and

durability over the old method. But the pegged shoes were less flexible than the sewed shoe, and many, persons still asked for shoes made by the old method.

A pegging machine was invented in 1833, but none came into general or successful use until about 1857, when one called the " New Era " was invented by B. F. Sturtevant. The pegging machine and the McKay machine revolutionized the industry, but did not put an end to hand shoemaking, which has continued to the present day, yet with a constantly diminishing importance. The great gain, of course, was the large increase in the number of shoes made, with a lowering of the retail price and a widening shoe market.

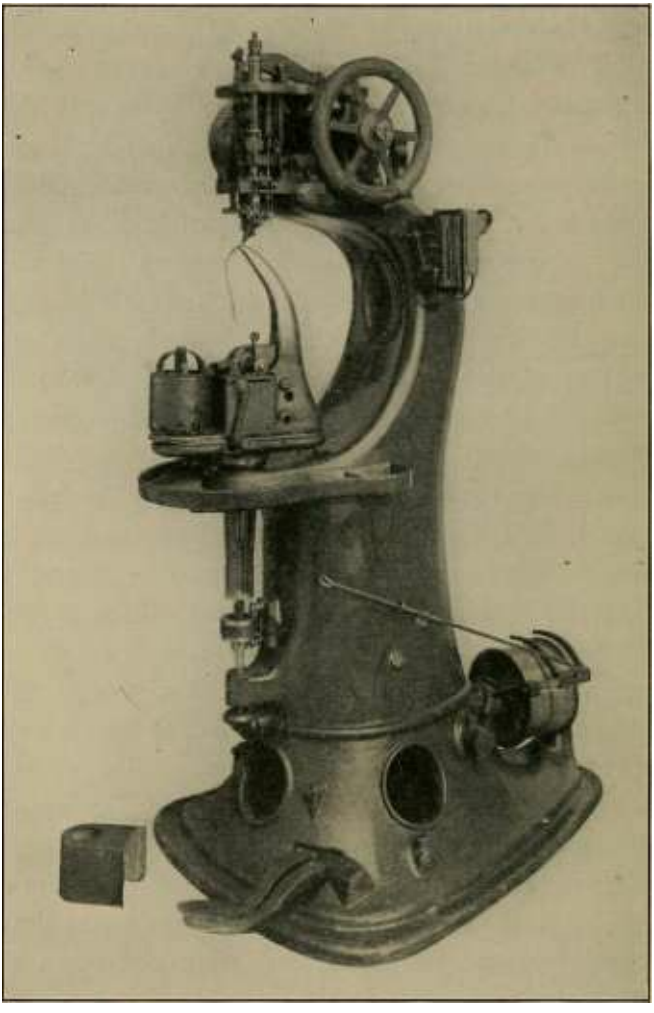
The Rolling Machine: 1845. The first machine to be widely used in shoemaking was the rolling machine for solidifying sole leather, which was introduced about 1845. Formerly the shoemaker was obliged to pound sole leather upon a lapstone with a flat-faced hammer, to make it firm and durable for the shoe bottom. This was a laborious process, and sometimes took a half hour for what can be done between the strong rollers of the machine in one minute.

The Howe Sewing Machine: 1852. About the year 1851 John Brooks Nichols, a Lynn shoemaker, adapted the Howe sewing machine to sew the uppers of shoes. John Wooldredge, also of Lynn, was the first to use the machine, in 1852. This adaptation really introduced the era of machine shoemaking, doing away with the slow process of hand

sewing. The process had been called " binding," and the handsewers were called " binders." Much of this work had been done in the home, and the introduction of this machine made the industry more distinctly a factory industry, marking the first period of development.

The McKay Sewing Machine: 1858. In 1858 Lyman R. Blake, a shoemaker of South Abington, now the town of Whitman, Massachusetts, invented a machine which sewed the soles of shoes to the uppers. This was improved by Robert Mathies and manufactured by Gordon McKay, a capitalist and manufacturer. It became known as the McKay sewing machine.

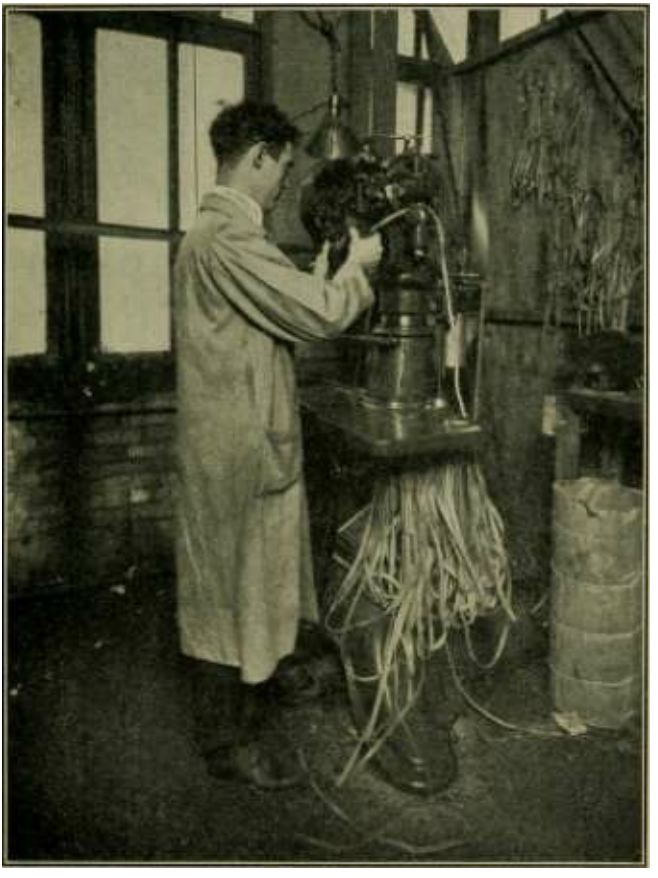
These machines were first used in the factory of William Porter and Sons of Lynn in 1861 or 1862, and were run by foot power. The McKay machine ushered in the second period of development in shoe machinery, and has done more than any other to modernize shoe manufacture.



The McKay Sewing Machine Today

SHOE MACHINERY

The Goodyear Welt Machine: 1862-1875. In 1862 Auguste Destouy, a New York mechanic, invented



Operating the Goodyear Welt and Turn Shoe Machine

a machine with a curved needle for sewing turn shoes. This was later improved by as many as eight

different mechanical experts employed by Charles

Goodyear.

The machine was afterwards adapted to the sewing of the welt in the bottom of the shoe, with patents in 1871 and 1875, and became the famous Goodyear welt machine. This marks the third great period of development in shoe machinery.

McKay and Goodyear were not themselves originators; they adapted and promoted the inventions of shoe worker and mechanic. Other inventions no doubt lacked such promoters and were lost to the industry.

Edge-Trimming and Heel-Trimming Machines: 1877. Edge-trimming and heel-trimming machines were introduced about the year 1877, and soon played a very important part in shoe manufacture. Previous to the introduction of these machines hand trimmers, or " whittlers," as they were called, received very high wages, sometimes double those of lasters, who were also highly paid. Considerable opposition was offered to the trimming machines, but their speed, uniformity of work, and saving to the manufacturer made their adoption and universal use inevitable.

The Lasting Machine: 1883. Though several attempts had been made to invent and operate lasting machines, yet long after it was possible and profitable to sew shoes by machinery, it was still

necessary to last them by hand. Shoe operatives in all lines opposed the introduction of machinery, feeling that it would reduce their numbers, shorten

Operating the Edge Trimming Machine

the period of employment each year, and make them more dependent upon the manufacturer.

Foremost in this opposition to machinery were the

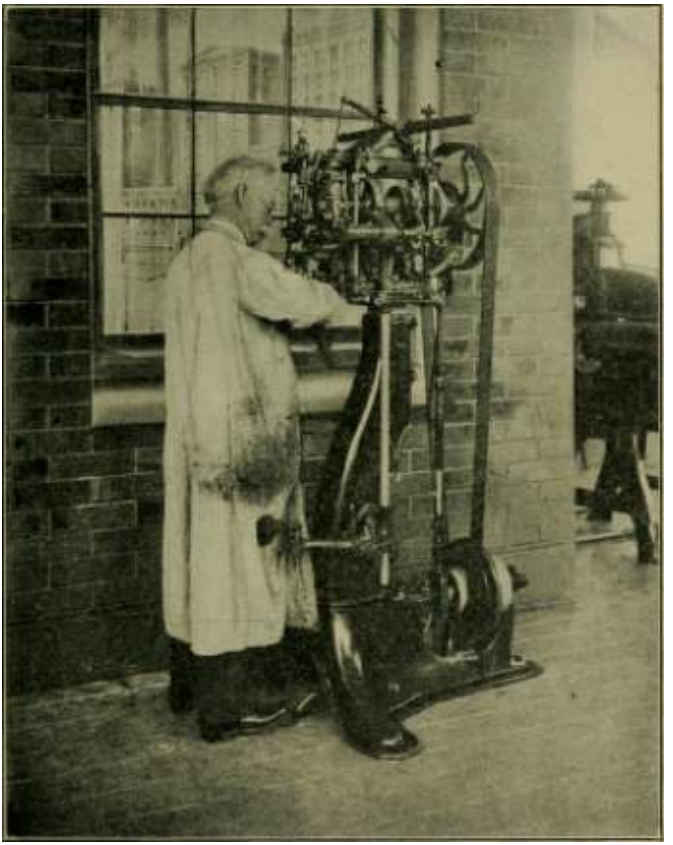
hand lasters. They were strongly organized, and secured a very high wage, ranging from twenty to thirty dollars a week or more at a time when earnings on most processes were low as compared with present day wages in the shoe factory. The lasters boasted that their trade could never be taken away from them.

A lasting machine invented by George Copeland, a lawyer of Boston, was exhibited at the Centennial Exposition at Philadelphia, in 1876. It was developed later as the Copeland-McKay Lasting Machine. It proved unsatisfactory, however, for finer grade work. There were no less than four such inventions in the market, soon after, at the same time. Matzeliger became the picturesque figure in the story of the lasting machine.

Jan Ernest Matzeliger, a young man destined to accomplish what seemed impossible, came to Lynn from Dutch Guiana. He was the son of an engineer and himself an expert machinist. In a Lynn shoe factory he learned to operate a McKay machine and heard the boast of the hand lasters.

Matzeliger began to work secretly on a model for a lasting machine. The first model was a failure, as was also a second. A third, however, was so satisfactory that money was advanced to the inventor for a fourth, in 1883. Matzeliger died while working upon this, but it was completed by other

men, and became the foundation of the modern consolidated lasting machine.



Operating the Welt Lasting Machine

The old lasters said that this machine sung to them as it worked, " I've got your job! I've got your job! "

Some of the motions of the machine are like those of the hand

and fingers, drawing the parts of the leather into place and fastening them by tacks. The hand worker lasted perhaps fifty pairs of shoes a day; the machine operator lasts from 300 to 700 pairs in a day of ten hours.

The Pulling Over Machine. This improvement was introduced early in the present century. The pulling over machine prepares the shoe for the lasting machine. It- centers the upper upon the last, draws the sides and toe into place with pincers which work like fingers, and temporarily fastens these parts with tacks for lasting. " It is the acme of shoe machinery intricacy and accuracy, and years of study, and over $1,000,000 were spent in its development."

While this amount seems large it probably means a saving to the shoe manufacturers of the United States of four times the amount each year.

Joseph L. Joyce. Joseph L. Joyce was a shoe manufacturer of New Haven, Conn., and a friend of Goodyear and McKay. From i860 to 1890 he obtained many patents which greatly improved shoe machinery and the art of manufacturing.

There are now machines large and small, simple and complicated, for making the various lesser parts of a shoe and its accessories, such as heels, counters, tips, eyelets, buckles, nails, thread, laces, polishing

brushes, and so on ; as well as machines for manufacturing the various items of factory equipment.

Power in Shoe Manufacture. Hand and foot power were first used for shoemaking. In 1855 William F. Trowbridge, at Feltonville, Mass., now a part of Marlboro, first applied horse power to shoe manufacture. Soon after this steam or water-power was in use in all factories. In 1890 the electric motor was introduced, and has gradually taken the place of the steam engine.

Operating a Complicated Machine. In some factories it is necessary, and in all factories advisable, that the operator of a modern, complicated shoe machine should understand its parts thoroughly, and be able to make the adjustments and simple repairs that may be needed at any time. The worker who has mechanical ability may learn to adjust and repair his machine by actual experience in running it.

The mechanically expert operative is able to keep the machine running to its full capacity and to lengthen its period of efficient wear. He is thus worth more to the factory, and has increased earning power under the prevailing method of piece work.

The Leasing System. The leasing system of shoe machinery was introduced in 1861 by Gordon McKay, when it was found difficult to sell to manufacturers the Blake machine for sewing uppers and

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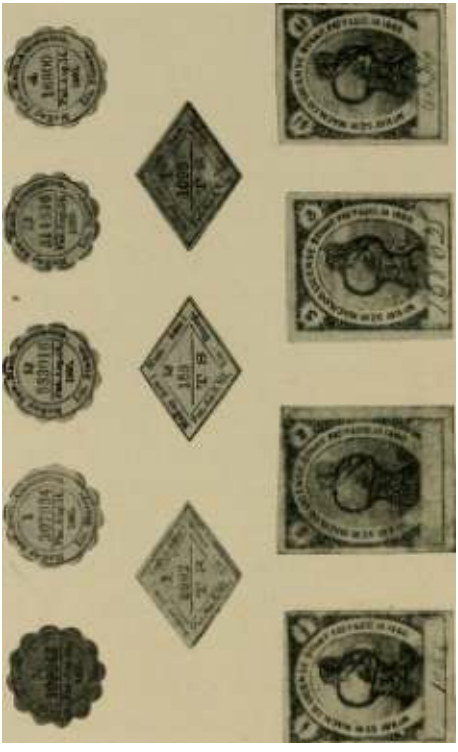
soles together. Such machines were costly and the capital of most shoe manufacturers was small at that time. The leasing system, on a royalty basis, enabled the manufacturers to have the advantage both of the machine and of unreduced capital for manufacture.

The Care of Machinery. Owing to the unusual conditions just described in the shoe industry and through the leasing of machinery, there was early developed by the machine manufacturing company a force of men who were trained in the care of machinery, and located at convenient centers, so as to go wherever machinery trouble existed. With the

evolution of the shoe machinery business, and the various machines used in the bottoming of shoes under centralized control, relatively few factories maintain a force of special mechanics, and these are generally for the purpose of millwrighting and construction. At the present time a large force of expert " roadmen," as they are called, is located in all the large shoe manufacturing centers, and in these agencies or branch offices from which they travel there is constantly maintained an immediately available supply of the many machine parts which are liable to wear or breakage. These parts are all numbered and catalogued, so that as soon as a part breaks or a machine goes out of adjustment, a telephone message brings to the factory the required

machine part. This service has been expanded to cover the instruction of operators upon the machines when set up in the factory.



Facsimiles of Early Royalty Stamps

The Standardization of Machinery. Because of standardization of machinery and processes and through co-operation between the manufacturer of

shoe machinery and the shoe manufacturer the growth of the industry during the last twenty years has surpassed all former periods. Today, manufacturers, large and small, can secure machinery by leasing it, and nearly all factories are conducted entirely on this basis.

This fact will make our study of the industry easier. We shall be studying operations on standard machines, used quite generally in this country and in many factories in other countries. We must remember, however, that improvements are constantly being made, that a process may be entirely changed on any day, and that the most skillful operatives of machines are in constant demand throughout the country.

The following account of the development of shoe machinery and the leasing system has been prepared expressly for this chapter by Mr. Arthur L. Evans, an authority of national reputation. The material presented in this account supplements the information already given in this chapter and sets forth most interestingly the leasing method which marks the shoe industry among world industries today.

The Development of Shoe Machinery

By Arthur L. Evans

Editor-in-Chief of the Retail Shoe Salesman's Institute, Boston, Mass.

The development of machinery and its successful application to the making of shoes excels in importance and romantic interest every other phase in the progress of the boot and shoe industry.

Until almost the middle of the last century the making of

boots and shoes had remained in the most essential way a pure hand craft. The workman, seated at the low bench or " form," typical of the industry, used with few additions the same tools with which his prototype was familiar back in the days of the pyramids. He either made the complete shoe or performed such a part of the work as might be required of him, for in some instances the organization of the work had progressed to the point where teams or gangs worked together, each member performing a particular part of the work, as described in the previous pages.

This era of specialization seems to have been an almost providential paving of the way for the introduction of machinery and the higher specialization which its acceptance entailed. The transition from a pure hand craft to the highly organized industry of the present time was closely associated with the lives of four men. They were in order Elias Howe, Gordon McKay, Charles Goodyear, Sidney W. Winslow, all of whom are now deceased. Of the four, but one was a great inventor; while of the remaining three it can be safely said that

no industry has produced men greater as organizers or of more conspicuous business genius.

While there had been an effort to produce machinery as an aid in the production of footwear, more particularly at the time of Napoleon, who was interested purely in finding some means that would increase the production of footwear

suitable for his soldiers, despite the rewards offered by him, all his efforts were unavailing.

A most important machine was the great invention of Elias Howe in 1848—the sewing machine. The privations and efforts of Howe in his home in Cambridge, Massachusetts, in working out this great invention which was afterwards to revolutionize the sewing together of fabrics is one of surpassing romantic interest. Assailed by other inventors, Howe after a long litigation established his right to the invention and placed himself among the foremost inventors of all time. The invention of his machine, while it had no immediate effect upon the shoe industry, was of importance as it set up a possible means of sewing parts which formed the shoe upper together and a new trend of thought in the minds of inventors. It was but a few years later that John Brooks Nichols, a shoemaker of Lynn, Massachusetts, adapted the machine for sewing leather, and the arduous duties of many New England housewives in binding the shoe uppers, as it was then called, ceased.

In the year 1858 there was patented by Lyman R. Blake, a shoemaker of South Abington, Massachusetts, a machine for sewing the soles of shoes to the upper. Prior to this time all sewed soles were made by hand, and were the most expensive and considered the most desirable type of footwear. This machine attracted the attention of Gordon McKay, who was a wealthy man,

as wealth went at that period, and he purchased the patent rights from Blake and began the development of the rather crude machine which he had purchased. Not only did he develop the machine of Blake's invention, but he foresaw the necessity of having the different parts of the shoe which were to be sewed by the McKay machine, as it afterwards became known, prepared with the greatest degree of uniformity, and to that end he began the development of a system of machines for that purpose.

Strange as it may seem, the centuries in which the making of shoes had remained so essentially a hand process had produced a very definite idea that it could never yield to the use of machinery, and McKay at the time that his machines were doing successful work found it impossible to sell them to the manufacturers, who repeatedly expressed their belief that the making of shoes by machinery was an impossibility. In the year 1861 McKay had practically expended his entire fortune— about $250,000—in an enterprise which then seemed doomed to failure. The Civil War, however, changed the situation so radically that manufacturers were inclined to investigate any means which would increase their production, for at that time shoemakers were leaving in great numbers for the front and the possibility of a great scarcity of footwear was plainly visible. Even this, however, did not convince shoe manufacturers that McKay's machine could be successfully employed, or at least to the point where they were willing to make an investment in such a doubtful enterprise. It was at this time that McKay's tenacity of

purpose and genius won the day, for he got out a series of small stamps representing different amounts ranging from one-quarter

of a cent to six cents, and went to the shoe manufacturers with this proposition, that, if they would take his machines and use them, he would put them in their factory without charge and would accept the small amount specified by the stamps as his part of what he claimed they would save; the manufacturer could have the rest. These little stamps which afterwards occupied so conspicuous a place in the introduction of machinery were arranged so that they could be applied, one on the heel of each so made, to different sized shoes, the greatest amount being for the large-sized men's shoes and ranging down to the smallest children's.

This was the beginning of what has since been known as the royalty system in the shoe industry, a condition which was forced by the shoe manufacturers, and it has since remained an inherent and conspicuous feature in the industry. Mr. McKay early discovered that it was necessary, if he was to get a return for his machines, that they should be constantly in operation and to that end he began the organization of an expert service in which men who were both shoemakers and machinists were employed, and it was their duty immediately a machine went out of adjustment or a part broke to hasten to this machine and get it back into operation as quickly as possible, for when it ceased to earn any money for the manufacturer, it also ceased to pay any income to Mr.

McKay.

McKay, after his first success, by the employment of inventors and the purchase of inventions, added very rapidly to the system of machines which he was supplying to shoe manufacturers. The heeling machine invented by Charles Glidden in 1867 was first successfully operated in Stoneham, Massachusetts, afterwards at-

tracted the attention of Mr. McKay in Lynn, and Mr. Glidden joined forces with him. A loose nailing machine, which drove nails which had prior to that time been driven singly by hand, soon made its appearance in common with other machines for preparing different parts of the work.

Through his genius for organization and persistency, Charles Goodyear finally produced a machine for sewing the welts to shoes, and other machines to form a system for not only preparing the work prior to the welting process but for the several processes which came afterwards, more notably those of stitching the outsole to the welt. Goodyear was many years in accomplishing his entire purpose, for the machines were of an unusually complicated nature, and one of less conspicuous ability and persistency would have despaired of ever reaching the success which came to the machines before Good-year's death in 1896.

The same method of placing the machines inaugurated by McKay was followed by Goodyear. Mr. Goodyear began an

organization of service in connection with the machines which was even more widespread and more successful than that which McKay had started. Offices located in different shoe manufacturing centers dispensed a service which was undoubtedly of great stimulating influence in the growth of the shoe industry.

The success of McKay and Goodyear stimulated the inventions of machines for almost every process in shoe-making and also induced many to invest in enterprises of a similar character. Until the latter part of the century there were many companies making machines for similar purposes and competing most bitterly with each other. One of the favorite methods of fining was

by injunctions claiming infringements of patents, and as factories had not advanced to the stage where many machines were employed it often occurred that one machine took care of the entire product for the particular process in which it was used. Thus the stopping of the machine by an injunction caused all factory production to cease.

It was due undoubtedly to these conditions that there came into being a corporation which since that time has been most conspicuously associated with the advance of the industry. It brought under one management the most successful machines employed at that time in shoe production and was the conception of the late Sidney W. Winslow. It seems that at different times there arose the possibility of one company's

controlling the outfit of machinery necessary for shoe production. Mr. McKay had attempted such a consolidation; Townsend, at one time a prominent figure in shoe machinery production in Boston, had entertained such an idea; and Charles Goodyear had thought at times such a thing might be possible. This consolidation undoubtedly was the product of the times and the great organizing genius of Mr. Winslow. The company which was formed by him was known as the United Shoe Machinery Company, afterwards changed to the United Shoe Machinery Corporation.

Under Mr. Winslow's guidance the great number of successful machines which were made by it were standardized. The production of parts was reduced to a practice in which every part was made with such nicety that it was possible to replace a broken part immediately for change or adjustment. The service inaugurated by Mr. McKay and improved by Mr. Goodyear was still further improved in a most conspicuous manner by Mr.

Winslow. It is said that no other industry enjoys the benefit of so efficient a service and that the great success of the corporation controlling this great number of machines has been almost entirely based upon it.

Mr. Winslow did not cease his activities with the machines which his corporation acquired, but began the improvement of machines then in use and the invention of machines to take care of processes which had successfully resisted all efforts

of the inventor. In comparatively recent times there have come into use two machines which were the product of the United Shoe Machinery Corporation; one the pulling-over machine, which was invented after many years of effort and an expenditure, it is said, of over a million dollars. This machine takes care of one of the early processes in the bottoming of shoes, and, while the expense of producing it was very large, it has been stated that the saving to the shoe manufacturers of the country incident to its use is over four times that amount annually.

Another machine, known as the clicking machine, for cutting out the different parts which form the shoe uppers, has been widely adopted, and with its introduction the last process in shoemaking which had not been successfully accomplished by machinery yielded. This machine accomplishes its work by the use of dies made from ribboned steel, so light that they do not mar the surface of the upper leather, and in some instances the mere act of cutting out the pieces has accomplished the same result as would be obtained in four different operations, and with great economy in the saving of material. The expert operator is further enabled to extend his knowledge of leather and the requirements of shoe uppers over a much larger amount of expensive

material. At present it is perfectly possible that there should be employed in the making of a pair of high-grade women's shoes 174 machine operations, 154 of which may be performed on different machines.

Because of the standardization of machinery and the high type of service which is supplied in connection with the machines in every shoe center, the growth of the shoe industry in the last twenty years has surpassed all former periods. It is possible for shoe manufacturers, both large and small, to secure machinery by leasing it, and nearly all in the industry have followed this method of securing their machine equipment, knowing that whether large or small they are on exactly the same basis in this essential part of shoe manufacture.

CHAPTER III LAST-MAKING

The last is the wooden form which determines the size and shape of the shoe. Last-making is not a part of shoemaking, but is a necessary preliminary process or set of processes, as is also pattern-making. The last-maker is a wood worker. In early times the hand shoemaker fashioned his own last, a single form for both right and left feet, with rough proportions. Only within about thirty years have separate forms been used for right and left lasts. With advance in methods of shoemaking last-making has become a definite separate industry, and last factories have been established in most of the great shoe centers of the country. The last item in the cost of shoe manufacture varies greatly, according to changes in the style of footwear.

The Shaping of the Last. The last is modeled from the human foot. The shape of the last is determined by careful

measurements of the foot modified by the use or kind of wear expected, by the prevailing demands of style, the peculiar processes of manufacture, and the special materials used. The last must have a " mean " form, adaptable to

the varying shapes of the foot upon which the shoe is to be worn. In the case of shoes meant for special purposes, such as walking or dancing, special forms are used. There are, also, sectional and national differences of form; for instance, the prevailing English styles are somewhat broader and flatter than the American; while in American lasts the waist line, or measure over the instep, is less than in English styles, giving a closer fit in that part of the shoe and preventing the foot from sliding forward in it.

Last Material. Lasts are made of wood or iron. Iron, however, is used less and less in this country except in repair shops. It is still used extensively in England. The wooden last has a plate of iron upon the heel, as a base for nailing on the heel of the shoe, and lasts used in making the McKay shoe, whose entire sole is nailed on, have a plate of iron over the bottom of the last. In England the wood used for lasts is mostly beech, whose close and strong fibre allows a smooth, firm surface, however the grain may be cut. In this country the wood generally used is maple, which cuts easily and presents a smooth, hard surface when kiln-dried, as all woods must be for last-making. The hollow forms used by traveling salesmen, in the store window for display, and in the home for keeping shoes in shape when not being worn,

are made of light bass wood.

Hand Last-Making. It is interesting to review the processes used in earlier hand last-making, as they show not only the older features of a skilled trade but also the work that is still necessary in a modern industry. The tree trunks brought from the forests were sawed into suitable lengths for lasts. The lengths were " blocked " or split into triangular pieces large enough to afford each a last when cut down. The pieces were then cut down with the bench knife into shapes approaching that of the finished last, and were cut to the desired length. The roughly formed last was then rasped and scraped until all surplus wood was removed. Holes were drilled or bored for the insertion of hooks to draw the last from the completed shoe. The last was finished by sandpapering and rubbing down.

Modern Last-Making. Because of the increase in the numbers of shoes manufactured and the multiplication of styles, it long ago became necessary to produce lasts faster than could be done by hand. Early in the last century, about the year 1820, we find the last-making machine, or last-lathe, long antedating the use of shoe machinery. The last-lathe is a modification of the wood-turning lathe, first adapted to turning out axe handles and gun stocks. Instead of producing symmetrical forms the lathe is made to yield forms of irregular shape, like that of the human foot. The lathe has been but little

changed in later years. Its chief features are what are known as the model end and the cutter end.

The Last Lathe

The blocks from which the lasts are to be turned are brought from the forests in the rough, sometimes cut by hand and sometimes by a lathe into shape

approaching that necessary for the last. Before being utilized they are kiln-dried for six or seven weeks, so as to prevent the finished last from shrinking.

The Model Last. The making of the model from which other lasts are to be made is the most difficult process connected with the industry. An old last is sometimes built over by adding thicknesses of leather in places, or a paste of glue and sawdust, and by cutting down the wood in other places to produce the measurements necessary for a desired style. Sometimes the model is entirely new, made by hand to meet the required measurements. A standard size is used, a number seven or eight in men's shoes and a four in women's shoes. From these, by adjustments of the lathe, sizes and widths are graded up and down, usually five sizes each way. Three models are generally made use of for children's lasts.

The Use of the Last-Lathe. The standard model last is clamped in the model end of the lathe, and the rough block of kiln-dried wood from which the last is to be turned is set in

the cutter end of the machine. When the machine is put in motion the model swings against a model wheel, at the same time that the last block is forced solidly against the cutter wheel. As both the model and the block revolve, the model wheel guides and regulates the

knife which cuts the block, from toe to heel, into an exact duplicate of the model, except for projections at either end which are cut down on the heeler or shaving machine. The last is then placed upon a polishing wheel for the processes of finishing. The bottoms are tested by a sole pattern of the desired size, and the size and width are stamped on them. Metal heels or entire metal soles are also attached. The lathe machine works so accurately that the slightest imperfection or variation in the model is reproduced in the finished last. A jnachine turns out about fifteen pairs of lasts an hour.

Devices for Reducing Last in Use. There are various methods of making a part of the last removable or reducing its length, so that it may be more easily drawn from the finished shoe or inserted in a shoe. The earlier and a still common method is to saw out a portion of the instep of the last, leaving what is called the block last. Formerly by having variously shaped substitutes for the part sawed out modifications of styles were effected. Another form is the Arnold hinged last, the last being cut entirely in two, a V-shaped portion cut out of the instep, and the two parts joined by a hinge, so that the heel swings up freely. Some firms make a business of remodeling or building over lasts for

shoe manufacturers to meet changes in style. And old lasts are sometimes steamed to restore their shape and fulness.

The Storage of Lasts. The lasts when made, or when returned from factory use, are usually stored in bins, by styles and sizes, in a room convenient to the lasting or making room. They are also sometimes stained different colors to indicate different

The Last Storage Room of the Shoe Factory

styles or different widths of the same style. When required for use they are taken from the bins, in sets according to lots of shoes to be made, placed upon the shoe racks, and started on their way through the factory.

One person, very frequently a boy, usually has charge of the storage room. He must be thoroughly

familiar with the lasts in his care, and able to select quickly such as may be called for each day.

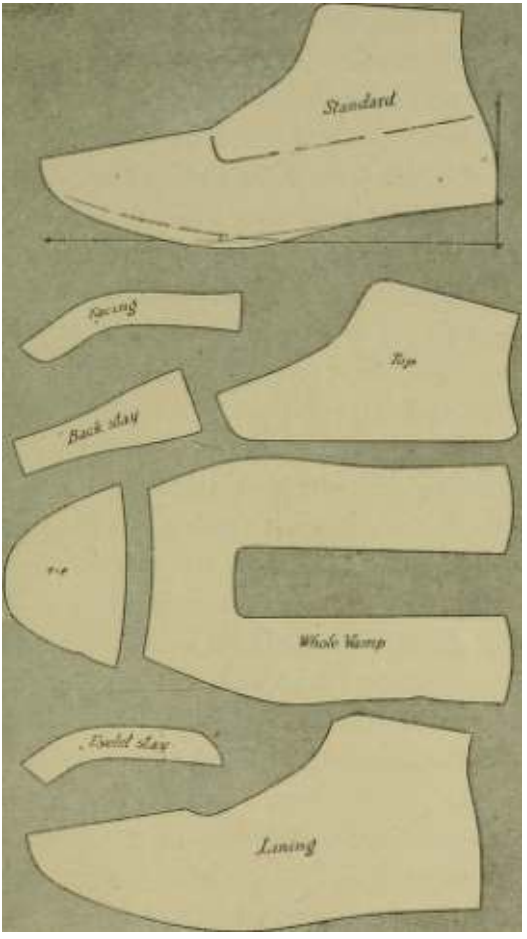
To become a last maker one must have mechanical ability to learn any or all of the few processes involved. The work is interesting but requires the constant attention of the operator, as the slightest error or inaccuracy would result in an imperfect last. The operator has a fairly constant occupation, as the last factory runs more steadily through the year than

does the shoe factory, and experience and skill are an asset to the last worker. His earnings run higher than those of the average shoe worker.

CHAPTER IV PATTERN-MAKING

Patterns are the forms or shapes used in cutting the various parts of the upper portion of the shoe. While a sole pattern is sometimes used, the sole is generally blocked or died out in the rough, being trimmed to shape in a later process. Pattern-making had advanced from a very rude beginning to processes requiring the highest skill and adaptation to modern styles. In early days patterns were made of paper. Sometimes tissue paper was wet and placed upon the last, marked in lines where the joints of the upper should be made, and cut in these lines when dried and removed from the last. There was no allowance for grading fn sizes, and separate lasts were used for the various sizes.

The Pattern Designer. In a modern shoe factory there is a person called the designer, who makes a constant study of styles. He receives the suggestions of the traveling salesmen, who are always on the watch for novelties in style and fashion. He seeks information from every source as to the permanency of old styles, the popularity of the new, and of changes in dress and custom that are likely to



Pattern Standard Showing Heel Pitch, and Separate Patterns of Upper Parts.

Courtesy of the Retail Shoe Salesmen's Institute, Boston

demand still other styles in footwear. The designer is in close touch with salesmen, manufacturers and department heads in his own factory. He sometimes acts as superintendent of the pattern-making department. Upon his skill and judgment depend in large measure the volume and permanency of trade secured by his company. He should have high artistic skill and knowledge of shoemaking. The ordinary designer must be familiar with about 25,000 different designs.

Frequently after a study of styles, the designer, the sales manager, and the factory manager confer on the most economical styles to be made.

There have already been established a few factories for the designing and making of shoe patterns, to sell to the manufacturer.

The Pattern Model. In making a model for patterns the last is taken as a basis. With due consideration of the shape and style of the shoe, the material to be used, and the use to which the shoe is to be put, the pattern is made to conform to the proportions of the last. The last-maker and the pattern-maker work together to a definite end of utility and style.

Sample patterns are submitted to the manufacturer for approval, after which the pattern-maker draws plans for his model. The sets of model patterns are cut in sheet iron by hand. Patterns are

reproduced from them in sheet iron or in cardboard by the pattern machine. The standard size of the model is seven in men's shoes, and four in women's, and by gradations above and below these numbers, as in last-making, other sizes are obtained.

From the model the pattern-maker produces such quantities in each size as may be desired in a factory.

The Trial Shoe. Sometimes a shoe is made as a trial or sample of a new style. This is taken out by the salesman and shown to the trade. If sufficient orders are placed on this particular shoe, patterns are made and the shoe is manufactured in quantities.

The Number of Patterns to a Shoe. The number of patterns necessary for the ordinary shoe varies according to the kind or style of shoe. The button boot, for example, has the following parts, each requiring a separate pattern: Two quarters, two linings, button-piece, button-piece lining, top stay, vamp, foxing, tip, back-stay, vamp-lining, button-stay, backer for buttonholes, and marker for buttonholes. Other kinds of shoes have a larger or smaller number of parts.

Pattern Material. Sheet iron has long been used for patterns, and is still largely used for those of linings and the cloth parts of shoes. " Junk-board," or heavy cardboard, made by grinding up old newspapers, is gradually taking the place of sheet iron, some factories using it altogether. Zinc, also, is

used. Wooden patterns are sometimes used for the soles of shoes, by which the soles are shaped upon a sole-rounding machine.

Making Patterns. The iron model is clamped to the bed of the grading or pattern-making machine. This machine operates by a system of levers, so that the model is reproduced in junk-board or iron, just as in last-making the last is determined by the model. By lengthening or shortening the levers sizes above and below the model are produced. Junk-board patterns are then bound with strips of metal which are smoothed at the corners and soldered at the joints. The patterns are then stamped with size numbers, widths, and styles. Sometimes various colors of the junk-board are used to indicate different widths.

The Standardization of Lasts and Patterns. There has been considerable effort in recent years to standardize patterns for those parts of the shoe which change least in shape from season to season. This is accomplished largely, of course, through permanent forms in corresponding parts of the last, especially the parts back of the ball of the foot. A reduction in the number of patterns used by the cutter or of the dies required for a full run of sizes, when dies are used, is a great gain in shoe manufacture.

The constant increase in the cost of shoe material

makes it all the more necessary to reduce cost in some other

line. This reduction can be accomplished in part by reducing varieties in form, or by a standardization of patterns.

The Storage of Patterns. The patterns when made in quantities are stored in racks or pigeon holes, according to sizes and kinds, in a pattern room which is convenient to the cutting room of the shoe factory.

Positions in the Pattern-Making Department. The positions in this department are: the Designer, or superintendent of pattern-making; an assistant designer, in very large establishments; the model grader, who does hand work; the power grader, who runs the pattern-making machine; the truer-up, who levels the metal pattern; the binder, who puts the steel border on the cardboard pattern; the finisher, who solders and smooths the binding; and the stamper, who places the necessary numbers upon the pattern.

The pattern boys have charge of the patterns in storage, taking them to the cutting room and bringing them back and placing them in their proper spaces after use.

The Pattern Maker. The pattern maker may be a person skilled in some of the operations of shoe-making. He should at least be familiar with its general processes, and should have good mechanical

ability. The occupation, like that of the last-maker, is less crowded than most of the divisions of the work in the shoe

factory.

The Price of Patterns. " It is figured in a general way that a manufacturer of women's shoes should spend at least one-half of one per cent, of the gross volume of his business for patterns. That is, if he is doing a business of $1,000,000 annually, he should spend at least $5,000 for new patterns. It is quite likely that some manufacturers are spending a larger percentage than this. In the last few seasons, a number of manufacturers have had to increase their expenditures for patterns, because patterns have become much more important in the making of shoe styles than they ever were before. While complaints are common that too much money is spent for patterns, yet the pattern bills are among the smallest that a manufacturer has to pay. They are nowhere nearly as expensive as lasts, nor as costly as the trimmings that are used to put style into shoes.

" Sometimes it pays a manufacturer to buy a new set of patterns, just for the purpose of getting out a new style in footwear. For instance, supposing a manufacturer buys a new set of patterns, at twenty dollars, and livens up his line during the dull spell of between seasons, and gets orders for one hundred cases of shoes made according to the new patterns. His profit is five cents a pair, and his total profit is

$180. Surely it is worth while to spend $20 to make $180. Of course, the real cost of the patterns depends upon the number of times they are used. They may be thrown aside at

the end of the month to make way for new patterns. In that case their cost will figure high. But if they are used through a season, and are carried over to the next season, then their real cost figures down pretty low. But the main point, in dealing with the pattern department, is not to consider chiefly what patterns cost, but chiefly what they bring in the way of new and additional orders." 1

1 American Shoemaking. Boston, March 6, 1015.

CHAPTER V LEATHER

Its Nature. Leather is, the skin of an animal, tanned or otherwise preserved, shrunk, and toughened. The skins of beast, bird, fish, or reptile maybe made into leather. Leather in some form has been used from time immemorial for clothing, footwear, harness material, and other articles for human use.

Tanning. Tanning consists in converting animal skins or hides into leather by the use of astringent acids. In earlier times these acids were derived from vegetable products, such as the bark of the hemlock tree, oak tree, willow, and chestnut. The bark was finely ground and steeped in water, forming a strong solution or liquor in which the skins were placed in vats, after the removal of hair and surplus flesh. The action of the acid toughens the skin, condenses it and hardens the albuminous matter in it, thus preserving it from decay. The most common kinds of bark used have been the

hemlock and the oak. Some months are required in the process, and the longer the time taken usually the better is the quality of the leather produced. In

later years mineral substances, of which chrome alum is a characteristic example, have come into quite general use for tanning. This mode is called chrome tanning. The acid processes require a short time for tanning in comparison with the bark proc-

Operators at Shaving Machines, Upper Leather Tannery, W. H. McElwain Company, Manchester, N. H.

esses, but demand careful attention to prevent injury to the leather. They afford various effects in the coloring of leather. Such leathers are usually finished dry or with only a light application of oil. The bark-tanned leathers go through various lengthy oiling processes, according to thickness and the purposes for which the leathers are designed.

Chrome tanning has transformed the shoe and leather industries.

American Leather Manufacturing. The American leather industry has grown from small beginnings along with shoe manufacturing. The first leather used was imported from England. The colonists also used Indian tanned deer skins.

The first tanner to settle in this country was Francis Ingalls of Lincolnshire, England, who came to Lynn in 1629. Philemon Dickerson, an English tanner, came to Salem in 1637. The tanning of leather was carried on at the same time probably in New York, Pennsylvania, and the Southern Colonies. In 1800 William Rose, another English tanner, was induced to come to Lynn by Ebenezer Breed, who had done so much to promote American shoe manufacture by means of the protective tariff on shoes. Rose became " the father of the American morocco manufacturing industry."

Shortly before the War of the Rebellion, machinery was introduced into the tanning industry, and today machinery is used in the place of hand labor in all its branches..

Machinery and the chrome process have given American tanners leadership in the leather producing industry.

American tanneries treat annually about 20,000,-000 hides, or heavy varieties of leather, and about 100,000,000 skins, or lighter varieties. They import

annually more than $50,000,000 worth of untanned skins from Europe, Africa, India, China, Siberia, Australia, and South American countries. American tanners produce each year about $300,000,000 worth of leather. Of this the greater part is used in the manufacture of boots and shoes. A much smaller part is used for upholstering, automobile^ and furniture, harnesses, bookbinding, machinery belting, trunks and bags, card cases, pocketbooks, gloves, and novelties.

The Increasing Shortage of Leather. In recent years the leather-producing animals the world over have been either actually decreasing in numbers, as in the great West of this country, or have not increased as rapidly as has the demand for leather. The population of the various countries of the world increases steadily and the wearing of shoes becomes more widely a custom in the less civilized countries, as in the case of the countries concerned in the Spanish War, and new uses are steadily found for leather. Such a generally increasing demand tends to raise the price of leather and of leather products. Any lessening of freedom in the commerce of the world, as in the case of the European war, tends also to bring about higher prices in leather products as in other

imported articles.

Leather Substitutes. As a result of the growing shortage of leather, the use of leather substitutes

is becoming more and more common in the shoe industry. First and chief among substitutes for upper leather are the fabrics, white canvas being most used. The fabric top does not stretch, affords a good-looking shoe, and would find an increased demand even if there were no shortage of leather. It has becomd a fashion in some localities to have the top of the woman's shoe match the dress. This can be done easily by the use of fabrics, as well as by fancy leathers. Among substitutes for sole leather, leatherboard has been widely used. This consists of fibers of hard leather, waste paper, rags, and wood pulp, rolled into hard sheets by machinery. It is cut and handled in the same way as sole leather, and is used in particular in making the bottoms of the cheaper grades of shoes. Wooden heels cut in block are widely used in the making of slippers and the lighter kinds of shoes. Waterproof felt is also coming into use more and more for the sole of the shoe. Celluloid and even oilcloth products are sometimes used for the toe boxes. It has long been the custom in shoe manufacture to make heels of pieced leather. One of the latest substitutes is " hideite leather." This is a leather fiber product consisting of soft leather skivings or remnants pressed into sheets. Fish skins have recently been converted into leather. Rubber is used more and more extensively for the bottoms of shoes, and is in increasing demand on the part

of the public.

The Tannery Divisions of Hides and Skins. According to the size, the general divisions made in the tanneries are three, as follows:

First, " hides." This is the term used for skins of full-grown or large animals, such as cows, oxen, horses, the buffalo, and the walrus. These animals yield thick, heavy leather for shoe soles, machinery belting, or other uses demanding strength and durability. An untanned upper leather hide usually weighs from twenty-five to sixty pounds; a sole leather hide, from forty to seventy pounds; hides weighing from seventy or seventy-five pounds up are used for the heavier kinds of belting.

Second, " kips," skins of the smaller beeves, weighing from fifteen to twenty-five pounds.

Third, " skins " of such animals as calves, sheep, goats, and dogs.

The skins of other animals are used for leather. The kangaroo, for instance, provides one of the best leathers used in shoemaking. Upper leather is made mainly from cow hides, kips, and large calfskins.

Because of the greater demand for thin leathers, thick hides are often split into thin layers by machinery. This is done by

passing the hide through a set of rollers between which is a keen knife, which divides the parts into any desired thickness. The outer parts of the leather, on the hair side, are the

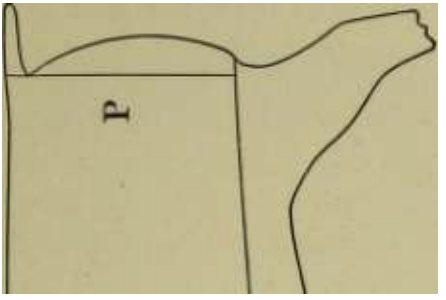
most valued, and are called " grain " leather. The inner parts are made into a variety of different kinds of leather by special treatment. Various kinds of finishes are given, such as seal grain, glove grain, oil grain, buff, satin, russet, or plain.

A Side of Leather. The larger skins are generally cut along the back into two halves or sides. The usual names for, the parts of each side are, belly, crop, head, back, shoulder, and bend. The belly contains approximately 24 per cent of the side. After the belly is " cropped," the balance, or 76 per cent of the side, is known as the crop. Taking the head off, or 6 per cent leaves what is known as the back, or 70 per cent of the original side. A shoulder, representing about 15 per cent of the back, is cropped, leaving the bend, representing about 55 per cent of the side. These are the different divisions known to the leather trade. The " bend " is the best portion of the back, behind the shoulders, the firmest leather of the entire skin. This part is devoted to the best uses and the higher grades of shoes, other parts to lower grades.

Divisions of Leather in Shoe Manufacture. In shoe manufacture leather is divided into two general classes, upper leather and sole leather. The upper leather includes the

outer parts of the shoe above the sole and leather when used for linings. Sole leather includes that used for the outer and inner

LEATHER



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soles, heels, counters, and rands. Upper leather is usually measured by the square foot; sole leather, by the pound.

The Varieties of Upper Leather. There are five chief kinds of upper leather, as follows: Kid or goat, calfskin, side leather, sheepskin, and coltskin or horsehide. There are also other kinds, such as kangaroo, chamois, buckskin, pigskin, and a few special and fancy leathers.

Kid. Kid is the name for leather made from the skins of full-

grown goats, coming mainly from the mountains of India, Europe, and South America. There are over sixty recognized varieties of goatskins. According to its tanning and finishing, kid is classed as glazed, mat, royal, cadet, patent, suede, bronze, pebbled or morocco, and so on.

" Glazed kid," from the French " glace kid," is polished after tanning, and its glossy surface is obtained by burnishing on the grain side. It is produced in various colors. Glazed kid is used for the uppers of shoes.

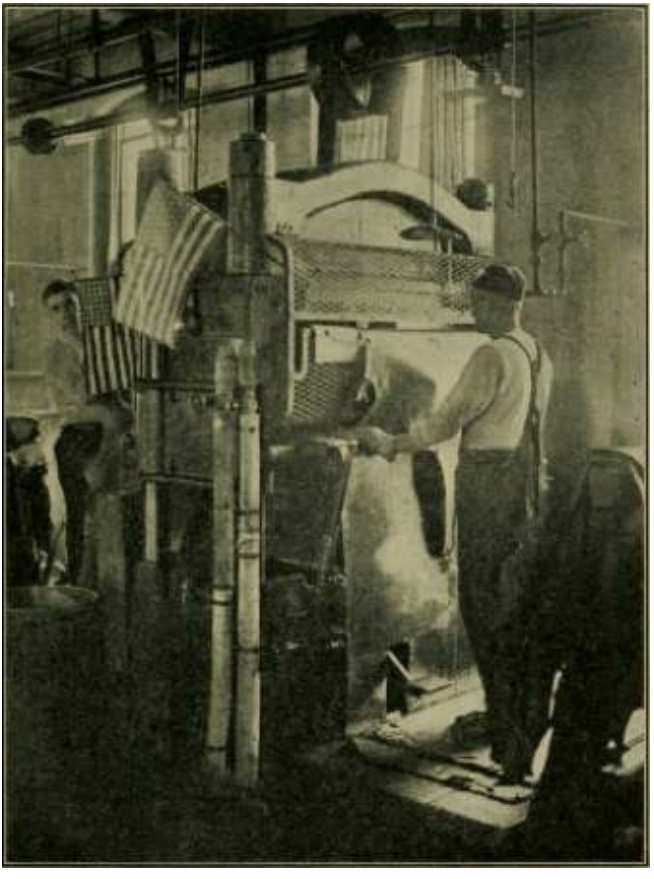
" Mat kid " has a dull, soft, black finish, from treatment with beeswax or olive oil.

" Patent " leather is produced by applying a coat of varnish to the finished surface of the skin.

" Enamel " leather has a hard, glossy finish on the grain side, being boarded and varnished.

" Suede" leather, a French term, means

" Swedish " finished. It is finished on the flesh side with a dry, napped surface. It is produced in a



Emoossing Upper Leacner, Upper Leather Tannery, W. H. McElwain Company, Manchester, N. H.

great variety of colors and used extensively in making slippers, and to some extent in light shoes.

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" Bronze kid," or calfskin, is leather finished with a form of

cochineal dye. This is a method long known and used especially for women's fancy shoes.

" Vici kid" is a name first used by Robert Foederer of Philadelphia, about 1885, and in common use now for chrome tanned kid dressed with a mixture of soap and oil. This term became a trademark, and refers generally to the better grades of kid leather.

Other kinds of kid are in less general use. They are finished in particular ways, according to effects desired. " Kangaroo kid," for instance, is kid finished in imitation of the genuine kangaroo.

" Chamois " is oil-tanned leather made from the skin of chamois and other small animals. It is a very pliable and washable leather when genuine.

Calfskin. Calfskin is the leather used most extensively in shoemaking. It is the lightest, most pliable, serviceable, and satisfactory of all the skins of the neat animals. Its main sources are the farms of the United States, Canada, South America, and European countries. It is finished in many forms, of which it is necessary to mention only a few, as box, gun metal, patent, wax, willow, boarded, velvet, ooze, and Russia. Kips, the middle weight skins already spoken of, and calfskins overlap in qualities and uses. The calfskin is never split, but is generally shaved to uniform thickness. The different

names applied to calfskin, as in the case of kid, refer to particular kinds of treatment in tanning and finishing the leather, and the terms correspond in the main with those already given for kid. A few special terms for calfskin are the following:

" Box calf" is a proprietary name. It is a chrome-tanned calfskin " boarded," that is, treated by rubbing with a board to raise the grain, giving a peculiar rough surface. Box calf is a waterproof leather of black or tan color, and is regarded as the best material for rough out-of-door wear.

" Buckskin " is primarily deer skin tanned in oil. In recent usage it means any soft leather, especially cowhide, finished in a white, grayish, or yellowish color.

" Gun metal " is chrome-tanned leather, either calf, veal, or side, with gun metal black finish, or with a bright finish. Gun metal leather is used very extensively in shoe manufacture.

" Wax calf " is finished on the flesh side with a waxlike surface. French calf, also, is finished on the flesh side.

" Willow calf " is a fine, soft, colored, chrome tanned skin.

" Ooze " is a proprietary term applied to the velvet or soft finish skin.

" Russia " is a colored calfskin finished and perfumed with birch oil, which gives it a characteristic appearance and

odor.

Side Leather. Side leather is a cow hide, either bark or chrome-tanned, with the skin cut down the back with two halves. The sides are split to reduce to thickness appropriate for shoe tops and finished in various forms with dry, oiled, smooth, or boarded surfaces, in imitation of the various finishes of calfskin. It is used largely in the cheaper grades of men's and boys' shoes.

Sheepskin. Sheepskin is used chiefly for shoe linings and outer parts where the wear is light.

Coltskin. Coltskin and the better part of the horsehide have firmness of texture and susceptibility to high polish. They are used in the form of patent leather and in dull finish, mainly for men's high-grade shoes.

Sole Leather. Sole leather includes the heavier and thicker kinds of leather from the skins of mature neat animals, such as are suitable for use in the bottoms and heels of shoes. It is tanned and finished so as to produce a firm, solid texture rather than great pliability.

Sole leather is tanned from:

Green hides generally ranging between forty and seventy pounds, with an average of about fifty-five pounds, and

Dry hides generally ranging between sixteen and thirty pounds, with an average of about twenty to twenty-two pounds.

LEATHER

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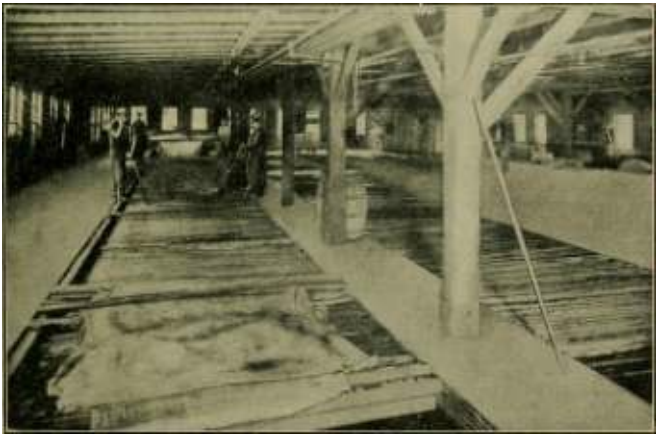
Beam House, where hides are prepared for tanning



Tan Yard, where hides are tanned in vats of liquor

Previous to ten years ago sole leather hides were tanned in liquors extracted from hemlock bark or oak bark, or a combination of the two, and the tanned leather received its name according to the tanning material used; namely, oak leather was tanned in oak bark liquors; hemlock in hemlock bark, and leather tanned in the combination of the two was called union. As the supply of bark diminished in the various sections where tanneries were located tanners were obliged to substitute other tanning materials, such as barks, nuts, and extract made from various foreign and domestic woods, so today leather is tanned in the combination of several materials and the finished product is designated according to the color of the leather which it resembles. Leather having a light color, resembling the color of old oak is called oak. That which has a more reddish shade is called union, and that which has a very dark red shade is called hemlock. Oak

leather is used largely in high-grade men's and women's shoes and for the finding trade. A large percentage of the union leather is bought by concerns which make a business of cutting soles, and these are sold to be used in the manufacture of women's shoes. Hemlock is used in the manufacture of medium and lower priced men's shoes. There is also a very large export business in this class of leather.

A very small percentage of sole leather hides is now being tanned by a chrome process, the basis of this tannage being bichromate of soda. It is practically the same process as that used in tanning chrome upper leather. Very heavy hides are generally used for leather tanned in this process because of the fact that the tannage does not swell the hides as does the vegetable process and it is necessary to get a hide averaging from eighty to ninety pounds in order to obtain the required thickness. This process produces a piece of leather which has a pearl gray color in its natural state and when waterproofed is of a dark greenish shade. The leather is used in the natural state for soles on cheap outing shoes and waterproofed for heavy storm shoes.

Oak tanned leather is the best kind of sole leather, as is indicated always by its market price. It has a light, creamy tan color, and is both firm and flexible. Hemlock tanned is of a lower grade than oak or union tanned leather. Chrome tanned sole leather is dense, hard, and durable, but has hardly passed beyond its experimental stage.

Hides, from which sole leather is made, vary according to climatic conditions in various quarters of the world. Animals living in warm climates have a thick and tough skin with thin hair; those living in cold climates have a thick coat of hair with light weight skin.

The cost of sole leather makes a large item in the general costs of shoe manufacture, and leather substitutes are used chiefly for sole leather.

Some other leather terms and varieties of leather not necessarily included in this chapter will be found in Chapter XVII, on shoemaking terms.

The Cut-Sole Room in the Shoe Factory

The Cut-Sole Industry. The great development of the shoe

industry in recent years has produced not only dealers of all kinds of leather and shoe supplies, but special manufacturers of the various materials required by a shoe factory. As in the case of the automobile, shoe manufacture may be made almost a matter of assembling prepared parts.

The industry connected with the preparing of shoe-leather parts is especially extensive, including cut soles, insoles, counters, heels, top lifts, taps, box toes, and rands. All these parts are now produced in highly specialized factories, and furnished to the shoe manufacturer at the lowest cost, in great numbers in uniform size and quality. Some of the largest manufacturing companies, however, have subsidiary factories in their plants for the production of such parts, but the smaller factories are compelled to buy them from the independent manufacturer.

Most of the lines of industry connected with the cutting of sole leather center in the United States, and there are no factories at all outside this country for cut-soles, heels, top pieces, and rands. There are forty cut-sole factories in this country, which do an annual volume of business of $40,000,000, supplying the home and foreign markets.

The establishments included in the following table manufacture leather from hides and skins of all kinds, domestic and imported, by various methods of tanning, such as the oak, the hemlock, and the chrome or other chemical processes. The classification also includes the currying and

finishing of leather to be used for various purposes, as in the manufacture of shoes, belting, gloves and mittens, bags, harness, and trunks; in the automobile, car-

riage, and furniture industries; and in the binding of books. Many establishments tan or curry and finish leather under contract for concerns other than those engaged in the leather industry.

Table VI.* General Statistics, Leather and its Finished Products: 1904 to 1914.

Industry

Total.

Leather, tanned curried, and finished

Boots and shoes.

Boot and shoe cut stock

Saddlery and harness

Boot and shoe findings

Trunks and va Uses

Belting, leather..

Gloves and mit tens, leather...

Leather goods, not elsewhere speci fied

Pocketbooks.

Census year

1914 1909 1904

1914

1909 1904

1914 1909 1904

1914 1909 1904

1914 1909 1904

1914 1909 1904 1914 1909 1904 1914 1909 1904 1914 1909 1904 1914 1909 1904

1914 1909 1904

Number of establishments

6,758 5,728 5,3i8

74i 919

1,049

i,35S 1,343 1,316

236 232 290

2,551 1,347 1,076

369 343 289 56l 524 373 151 139 117 352 377 339 378 425 423

64 79 46

Wage earners

Average number

307,060 309,766 264,459

$169,357,560 155,110,878 120,833,174

55,936 62,202 57,239

191,555 185,116 149,924

7,819 6,693 5,936

12,969 14,632 15,032

6,714

6,488

4,434

9,911

11,122

9,091

2,951

3,006

2,092

10/ "

n,354

10,645

7,071

7,

7,785

1,466 1,472 2,281

Wages

$753,135,354 669,874,518 480,220,706

3i,9i4,497 32,102,845 27,049,152

105,695,404 92,359,15 69,059,680

4,052,123 3,156,460 2,364,209

7,995,6i2 8,071,484 7,634,311

3,225,683 2,947,083 1,647,877 5,540,157 5,537,329
4,139,034 2,069,545 1,860,880 1,164,548 4,558,36o
4,763,830 3,840,253 3,603,865 3,623,200 3,137,125

702,314 688,615 796,985

Cost of materials

284,245,420 248,278,933 191,179,073

310,356,586 277,467,743 197,363,495

51,450,498 36,919,919 21,586,872

33,086,442 33,177,937 23,774,239

20,304,183 18,350,551

6,337,8io 13,625,457 14,629,065

9,107,785 15,480,110 15,622,603

9,317,206 12,170,694 13,208,001 10,000,. 10,632,124 10,290,439

9,626,614

1,783,840 1,929,327 1,926,723

Value of products

$1,104,594,557 992,713.322 724,391,050

367,201,705 327.874,[87 252,620,986

501,760,458 442,630,726 320,107,458

59,964,523 44,661,497 27,675,815

53,558,612 54,224,602 42,054,842

28,303,186 25,505,419 9,904,887 26,471,527 28,027,964 18,643,580 23,035,951 23,691,887 14,220,306 21,614,109 23,630,598 17,740,385 19,333,934 18,838,281 17,655,345

3,35o,552 3,628,161 3,767,446

* U. S. Census of Manufactures, 1914: The Leather Industry:

Table I.

LEATHER

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Leather, Tanned, Curried, and Finished — Value of Products for Leading States: 1914 and 1909.*

PENNSYLVANIA MASSACHUSETTS WISCONSIN
•NBW YORK NEW JERSEY MICHIGAN ILLINOIS OHIO

WtST VIRGINIA CALIFORNIA VIRGINIA DELAWARE
NORTH CAROLINA KENTUCKY MARYLAND
•NOIANA

NEW HAMPSHIRE MISSOURI MAINE

MILLIONS OF OOLUAR8

y/////////.y///jy////oy/////M^^^^

yW/M>A77////////Y///ss s//. Y/////?/7,

Y////////A '/////////, 7////////, Y/////////.'///,

- u^ J

W~j^^^^

•'

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^^2

^^?

Sf

^^

f I I

■MB 1014

*From U. S. Census of Manufacturers, 1914: The Leather Industry.

THE SHOE INDUSTRY

Table VII. Imports of Hides and Skins (except Fur Skins) into the United States during the Fiscal Years Ending June 30, 1913 and 1914, by Principal Countries, as Reported by the Bureau of Foreign and Domestic Commerce

LEATHER

Table VII.— Continued

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CHAPTER VI THE DEPARTMENTS OF SHOE MANUFACTURE

The Business Departments. The business side of modern shoemaking has definite and numerous divisions. There are the usual officers: President, vice-president, treasurer, superintendent or general manager, employment manager, welfare manager, office manager, and other heads of departments and divisions, with their many assistants. The functions and the duties connected with all these divisions are such as are found in the general business world, and are described in the volume upon Business Employments, which was prepared by the author along with this study of the shoe industry. From nine to ten per cent, or nearly one-tenth of the persons connected with the shoe industry, are em ployed upon its business side. The exact figures for 1914 were 90.5 per cent wage earners, or factory operatives, and 9.5 per cent salaried persons, proprietors and others.

The accompanying chart, on page 105, gives a list of the usual business departments and shows their three-fold nature,—of executive control, maintenance of business, and maintenance of manufacture. The

CHART OF THE BUSINESS DEPARTMENTS OF SHOE MANUFACTURE

STOCKHOLDERS

Employment Department

EXECUTIVE OFFICERS

DIRECTORS

PRESIDENT

VICE-PRESIDENT

TREASURER

SUPERINTENDENT

Office Manager

Social Service Department

GENERAL OFFICES

Order Department

Correspondence Department

Bookkeeping Department

Credit and Collection Dep't

Sales Department

Purchasing Department

Receiving Department

Publicity Department

Mailing Department

k

FACTORY OFFICES

Advance Information Dep't

Tag Department

Dispatch Department

Supply Department

Upper Leather Office

Schedule Department

Pay Roll Department

Cost Department

Messenger Service —

two divisions of employment and social service are in a sense independent of the three major divisions, or supplementary to them. The employment department deals with all questions of the hiring, training, and discharge of employees; the social service department, with all questions of their general welfare.

The Executive Officers. The executive officers are those who work out and control the general plans and policies of the company. They may or may not be stockholders. They are responsible to the stockholders for the success of the company.

The General Offices. The general offices are concerned in building up the business side of manufacture and reach out into the field of trade. These offices take charge of the orders received from shoe dealers, of correspondence, bookkeeping, and the credits and collections of the company. They have charge of purchasing and caring for materials used in manufacture, and of the large and important functions of advertising and of selling manufactured goods.

The Factory Offices. The factory offices are those concerned closely with manufacture, touching the factory at every department. These offices are often separate from the others

and placed as near the factory departments as possible. They take charge of tags made from the orders received by the order

DEPARTMENTS OF SHOE MANUFACTURE 107
CHART OF FACTORY MANAGEMENT

FACTORY MANAGER

Superintendents

Foremen and Forewomen

Assistants Floorpeople

Operatives throughout Departments

Messengers

department and follow them through the factory. They provide a schedule of the time in which shoes shall be made or passed from room to room. They maintain supplies for all factory purposes, pay employees, and Supervise the costs of manufacture.

Factory Service and Office Service. Factory service does not necessarily lead to office service. In general the two fields of employment are quite separate. Boys and young men, however, are sometimes taken into the business offices of a company, usually as messengers, and given at the same

time factory training, such as observation of processes and routine of manufacture. Less frequently the plan is followed of giving six months' training in an office and then the same period in the factory. The purpose in such double training is usually to prepare young men to act as assistants to superintendents or heads of departments. Sometimes, on the other hand, employees in factory departments who show clerical ability also are taken into the factory offices, where there is always need of practical knowledge of the work of the factory.

The Factory Departments. In the following chapters the present volume treats of actual shoemaking, or of factory departments and processes. There are six general divisions in the modern shoe factory. These are shown by the following chart upon factory departments. They are: the Upper Leather depart-

CHART OF THE FACTORY DEPARTMENTS

FACTORY DEPARTMENTS

Upper Leather Department

Stitching Department

Sole Leather Department

Making Department

Finishing Department

Treeing Department *

Packing Department

Shipping Department

ADDITIONAL DEPARTMENTS IN LARGE FACTORIES

Heel Department

Box Toe Department

Box Factory

Printing

* Treeing, Packing, and Shipping may be treated separately or as one department.

ment, the stitching department, the sole leather department, the making department, the finishing department, and the treeing, packing, and shipping department. These are each minutely subdivided into factory rooms, sections, or departments, as will appear in the following pages. The last

division, treeing, packing, and shipping, in a large factory, has three separate departments, making eight in the major divisions rather than six. In large factories we find numerous additional departments of which the chief ones are shown in the second division of the diagram, or heel department, box toe department, box factory, and printing department. There may be sub-divisions, also, in this second group, according to the magnitude of manufacture. A large company, indeed, may produce all its materials in the endeavor to lower the cost of every item that enters into shoemaking.

Other names are used for some of these divisions, usually according to locality; for instance, the stitching department is sometimes called the fitting department; the making department, the bottoming department; and the sole leather division is called the stock-fitting division. The word " room " is very generally used for " department " for the sake of brevity in speaking.

The Modern Shoe Factory. For a fuller statement of the nature and setting of the typical modern shoe

factory the reader is here referred to the introduction of this book. The modern shoe factory, in which are found the many offices and the factory departments just enumerated, has become quite typical in general form. The width of the factory is a very

Preparing Cartons in the Box Factory, W. H. McElwain Company, Manchester, N. H.

important consideration. Buildings are constructed with a width of about fifty feet, as single long buildings, or having wings of the same width, and less often in hollow squares, maintaining the same width throughout. This construction allows plenty of daylight along the middle of each room from the two

sides. As good light is necessary to accurate work, it is essential that rooms be constructed in this way.

In length, factories vary from about two hundred feet up to several hundred feet. The most common form is the long, single building, with capacity for a few hundred or perhaps a

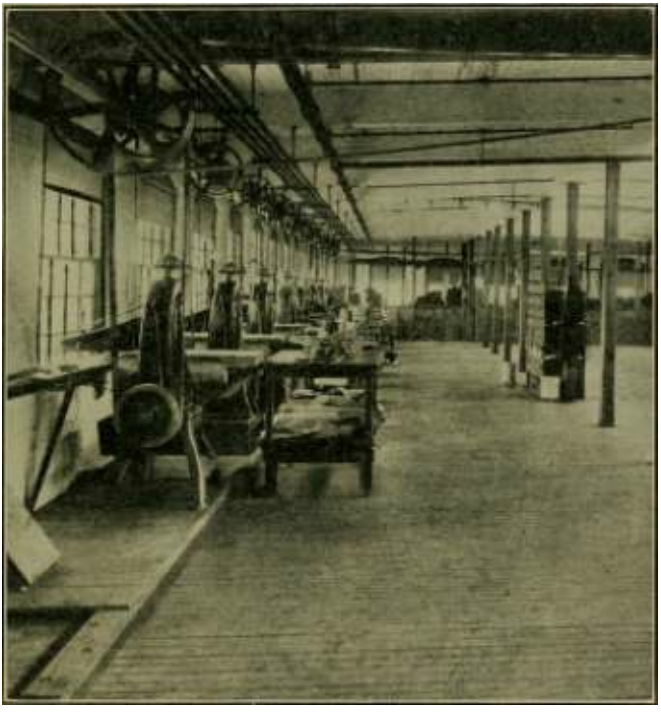
thousand employees. Some factories have small wings or adjacent structures. The plan followed by some very large manufacturing companies of extensive wings or units affords great length of rooms with floor space all well lighted from two sides, sometimes up to a quarter of a mile in length. Such plants employ four or five or more thousands of people, and turn out from ten to twenty thousand pairs of shoes daily.

The Typical Factory. The typical factory has four floors for its six major departments. The sole leather department occupies the first or basement floor. The upper leather and stitching departments occupy the fourth or upper floor. The making department occupies the third floor. The finishing, packing, and shipping departments are upon the second floor. The business offices are usually divided between the second and third floors. The factory offices are usually placed as near their factory departments as possible.

In the very large factories, or in the case of a plant consisting of several factories, there are usu-

ally central administrative offices, while the factory offices are in the various buildings of the plant.

Some large factories now have as many as seven or eight floors. In such buildings the general plan



A Modern Interior Showing a Row of Machines Placed by the Windows

already given is followed. The sole leather departments are on the basement floor; the upper leather departments occupy the top floor. Shoes in process

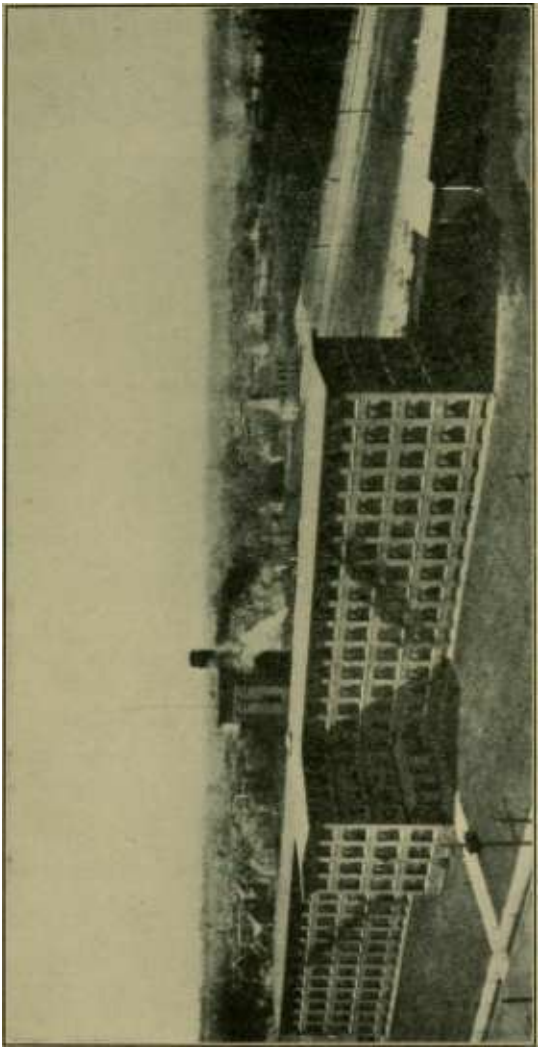
of making pass downward continually to the packing and shipping rooms on the first floor. Height is sought only when the length of the building is limited for providing needed

floor space. Indeed, the long, low building or plan of separate buildings

A Modern Interior Showing Overhead Light

is preferable in many respects, giving less movement of manufacture up and down, less crowding of employees, better light and ventilation, and less intense jar and rumble of machinery, all tending to improve the conditions of employment.

On the other hand, from the standpoint of the manufacturer, the closest working arrangement of rooms consistent with free movement and safety,



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THE SHOE INDUSTRY

is the better, since it brings smaller overhead charges, less expensive administration and oversight, and a quicker passage of the shoe from its beginning to its completion. Location and available building space,

Interior of a Modern Shoe Factory, showing light provision, with steel sash, heating system, and concrete floor

however, are the usual factors that determine the departure of a factory plan from the general and natural four-floor division.

The most modern shoe factories are built of steel and concrete, with the outer walls largely given up to window space, as may be seen in the accompanying illustration.

CHAPTER VII

METHODS IN SHOE MANUFACTURE

The Chief Methods. The chief methods in manufacturing shoes, developed mostly with the introduction of machinery, are as follows:

The Goodyear Welt, The Standard Screw,

The McKay, The Pegged,

The Turned, The Nailed.

The distinctions indicated in these terms arise from the methods of attaching the sole of the shoe to the upper, which has always been the most important problem of the shoemaker. Prior to the introduction of shoe machinery, all sewing upon shoes, the attaching of the bottom to the upper as well as sewing together the parts of the upper, was done by hand. In the beginning of the factory industry people often took parts from the factory to their homes for hand stitching.

The first improvements consisted of the use of wooden pegs and nails, leading to the use of the " standard screw." In the chapter upon the history of shoemaking we have noted inventions which have dealt with the attaching of the sole to the upper—

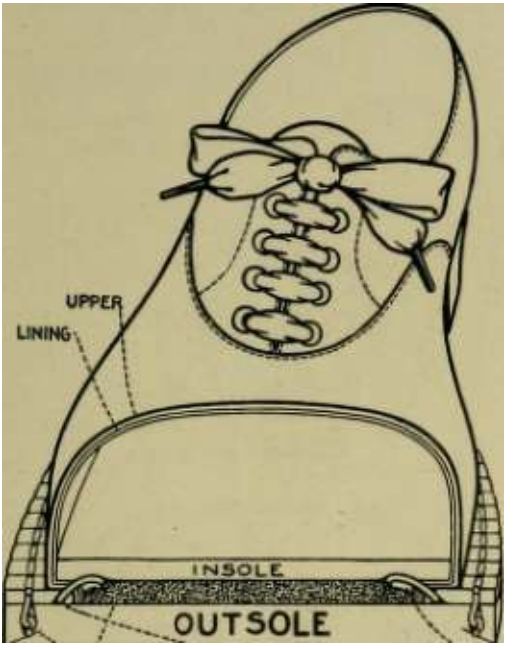
that of August Destouy in 1862, a machine with a curved needle for sewing turned shoes; that of Lyman R. Blake, adapted by Gordon McKay, introduced in 1862 for the same

purpose, and since known as the McKay sewing machine; and that of Charles Goodyear, who adapted the Destouy machine for turned shoes to the sewing of welts in 1871, known as the Goodyear Welt machine.

Illustrations of Methods Now in Use. Upon the following pages are presented diagrams and descriptions of the methods now in use in shoe manufacture. Most factories confine themselves to one or two of these methods, one manufacturer being known as a maker of Goodyear Welt shoes, another of McKay shoes, and so on. The lighter grades of shoes and those worn by women and children are Goodyear Welt, McKay, and Turned. Many of the heavier grades, and especially shoes for outdoor wear, such as are worn by farmers, fishermen, and soldiers in some countries, are of the pegged and standard screw. The McKay method has been very extensively used in medium weight and cheaper shoes for many kinds of wear. The Goodyear Welt, however, has been used more and more extensively in the medium and better grades and is the leading process in importance at the present time.

The Turned Shoe. The " turned " or " turn " method is used in making fine shoes and slippers for

women and children. The shoe is made wrong side out and then turned right side out. The sole is fas-



UPPEI}

LINING-,

v n —=» ■

-WELT.) ^-CORK FILLING."'-—STITCH UNITING ',
•"0UT50LE INSOLE. UP PER ;

CHANNEL AND WELT

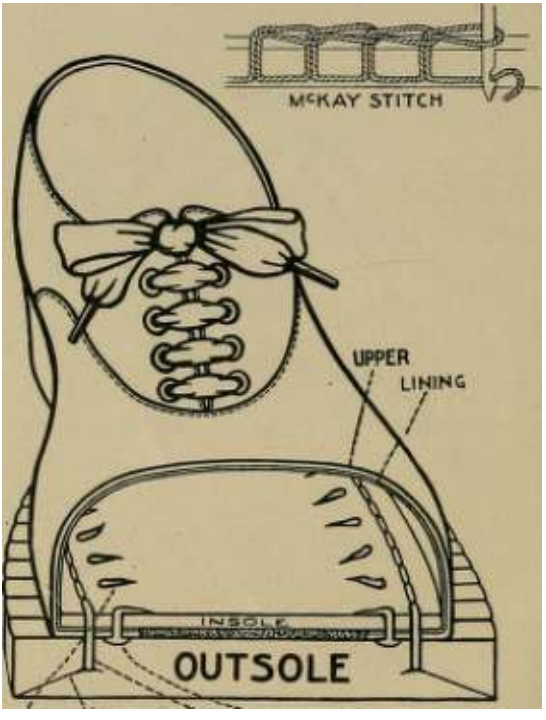
LIP OF INSOLF.--"

Cross Section of a Goodyear Welt Shoe

This diagram shows the ingenious method employed in con^ structing this now widely worn type of shoe, which is perfectly smooth inside. The tacks used in lasting are all withdrawn and a machine with a curved needle sews the welt and shoe upper to the insole without going inside the shoe. The heavy outsole is then stitched to the welt. The thread used is of the strongest linen and thoroughly waxed. It makes the most durable and comfortable type of shoe, and one on which the outsole can readily be renewed.

The excellent qualities and popularity of the welt shoe have led to many imitations of it in the McKay method.

tened to the last and the upper is drawn over it, wrong side out, and sewed to it through a channel cut in the edge of the sole. The seam does not show



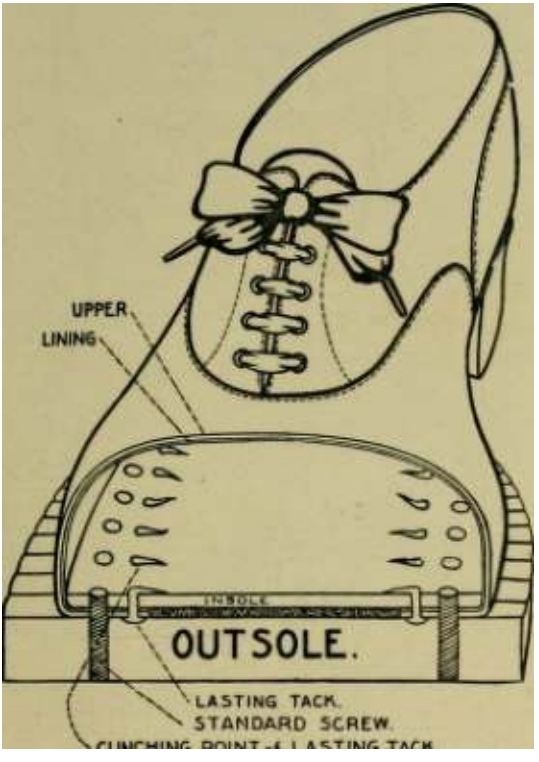
CHANNEL.\^-~LA5TING TACK. '^-CLINCHING POINT ^STITCH <AM C -KAY MACHINE «J LASTING TACK. UNITING 0UT50LE AND INSOLE.

Cross Section of a McKay Sewed Shoe

While this is a sewed shoe, it differs radically from those made by the Goodyear Welt process, inasmuch as the lasting tacks and a line of stitches appear inside. It is the method very generally employed in making the cheap and medium grades of shoes.

upon the finished shoe. The chief difference between the turn shoe and the welt or McKay is the

UPPER N LINING

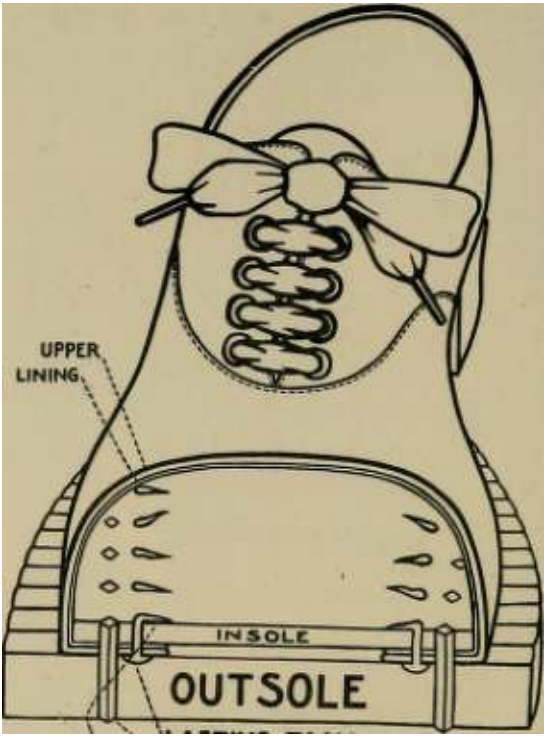


STANDARD SCREW. CLINCHING POINTоj LASTING TACK.

Cross Section of a Standard Screwed Shoe

In making this type of shoe the tacks used in lasting are driven away in and clinched against the steel bottom of the last. The heavy outsole is tacked in place and fastened by means of screws. The metal which forms this fastening is in the form of wire with continuous screw thread. When the screw reaches the inside of the shoe, the machine automatically cuts it' off and feeds to the next fastening. This method makes a strong but stiff shoe.

THE SHOE INDUSTRY



UPPER

LINING,

\ X 'LASTING TACK. \ PEG.

CLINCHING POINTo j LASTING TACK.

Cross Section of a Pegged Shoe

This type of shoe differs from the Standard Screwed shoe only in the sole fastening, which is of wood, in the form of a shoe peg. The machine which drives the fastening forms the peg from a coil of calendered beech wood, which, as it is required by the machine, is to cut into individual pegs which are driven by the machine and cut off inside the shoe. It is a method of manufacture which was very generally used in the early part of the last century, but which has been largely replaced by other methods.

The nailed shoe has nails in place of wooden pegs.

absence of an insole. Only good leather of pliable quality can be used successfully in making this kind of a shoe, which is distinguished always for lightness and flexibility. This method was extensively used for light weight footwear before the introduction of machinery. The chief process has simply become a machine process.

The Lace Shoe. The items shown in the analysis of the lace shoe are as follows:

Tongue and tongue lining, welt, welting thread, top facing, back stay, top, eyelet stay, foxing, laces, eyelet stay, top, back stay, bobbin thread, vamp, toe box, eyelets, top thread, outer sole, tip, inner sole, eyelet lining, doubler, steel shank, top-lift, heel, heel pad, lining, counter.

The Different Stages in Goodyear Welt Manufacture. The various parts of the Goodyear welt shoe as they are brought together in the making are shown in the illustration on page 125. They are:

1. A last.

2. An upper.

3. An insole.

4. Shoe lasted and ready to have welt sewed on.

5. Welt partially sewed on.

6. Welt entirely sewed on and shoe ready to have outsole laid.

8. Shoe with outsole laid and rounded. Channel

lip turned up ready to be stitched.

9. Shoe with sole stitched on.

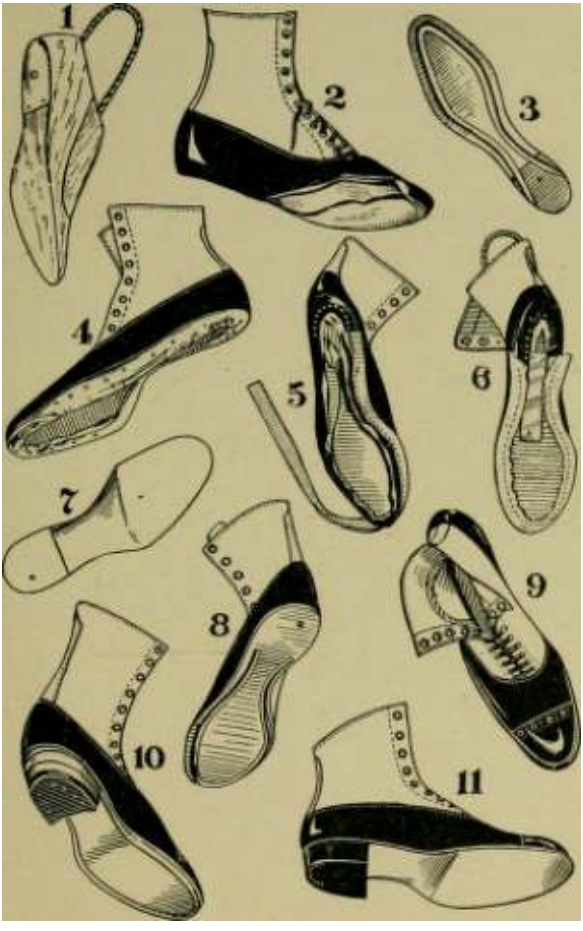
10. Shoe with heel in place.

11. Heel trimmed and shoe ready for finishing. ,

Production by Methods of Manufacture. The production of boots, shoes, and slippers, according to method of manufacture, was first reported in 1909.

Table VIII gives, by classes, for the United States as a whole, the number of pairs of boots, shoes, and slippers produced, by method of manufacture, for 1914 and 1909. Of the total number of boots and shoes manufactured in 1914, 41.4 per cent were made by the welted method and 37 per cent by the McKay, while in 1909 the largest number, or 43.2 per cent, were McKay and 35.3 per cent welted. Of the boots and shoes made for men, nearly two-thirds were welted, while the large majority of the boys' and youths' shoes were McKay. Women's shoes were more evenly divided as to the method of manufacture, 45.4 per cent being McKay, 35 per cent welted, and most of the remainder turned.

Of the total production of slippers, more than half, 51.2 per cent, were of the turned variety. For men's, boys' and youths', however, there were more McKay reported than turned. Nearly 90 per cent of the infants' shoes and slippers were turned.



A Goodyear Welt Shoe in the Different Stages of Manufacture

The metal-fashioned yield about 8 per cent annually, and the wooden pegged about 2 per cent of the total manufacture.

Table IX shows, by method of manufacture, the total number of pairs of boots, shoes, and slippers produced in the 12 leading states for 1914 and 1909.

The number of welted shoes made outnumbered all others in the states of Massachusetts, New York, Illinois, Minnesota, and Michigan. In 1909 this was also true of the last three states, but the McKay shoes produced in Massachusetts outnumbered the welted by a smaller number of pairs, and more turned were produced in New York than any other kind. All the other states shown in the table manufactured more footwear by the McKay than any other method in 1914, except Pennsylvania and New Jersey which show the largest number as turned.

Table VIII.* Boots, Shoes, and Slippers Produced in the United States by Methods of Manufacture: 1914 and 1909

1 Not reported separately.

2 Includes athletic, sporting, logging, and mining shoes, sandals, and felt and other fiber slippers

* U. S. Census of Manufactures, 1914: The Leather Industry. Table 43.

Table IX* Boots, Shoes, and Slippers Produced by Methods of Manufacture in the Leading States: 1914 and 1909.

1 Figures can not be shown without disclosing individual operations.

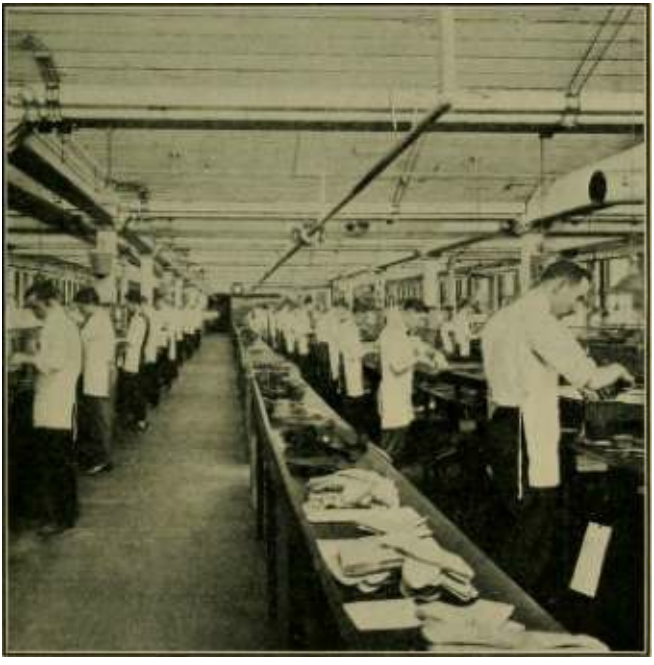
2 Included in "McKay," to avoid disclosure of individual operations.

* U. S. Census of Manufactures, 1914: The Leather Industry. Table 44.

CHAPTER VIII

THE UPPER LEATHER DEPARTMENT

The Importance of Detail in Shoe Manufacture. It is the purpose of this and the following chapters to present actual factory processes and employment opportunities in their order. Most shoe operators



Hand Cutters at Work, Thomas G. Plant Company, Boston, Mass. 129

are restricted to work on particular single machines and processes. In a few cases, especially in the smaller and older factories, an operator may perform several related processes; or, in other words, several related or consecutive processes may be combined in one or done on a single machine.

An average style shoe in the making must pass through over one hundred different pairs of hands and about one hundred and fifty different machines, involving over two hundred

processes, according to the methods of particular factories. It is clear, then, that the details of manufacture are of the highest importance, and that every factory department must observe absolutely the specifications of each lot of shoes.

The divisions shown in the following chart are the natural divisions of the upper leather department, as will appear in this chapter. Trimmings and linings need not be separately presented at length. Pattern making, which has been treated separately in Chapter IV, is sometimes made the first division of the upper leather department, where patterns find their chief use.

It may be said here, also, that the general plan and system of this department and of the other departments of shoemaking are the same in all factories, and that practically the same machines are in use everywhere, but that details and minor

processes are so numerous that variation in them is to be expected. It will not be wise or necessary,

CHART OF UPPER LEATHER DEPARTMENT

UPPER LEATHER DEPARTMENT

Sorting Department

Trimming Cutting and Dinking Department

Lining and Cloth Cutting Department

Upper Cutting Department

Counting, Marking, and Skiving Department

Assembling Department

then, to go into the minutest details of manufacture in these pages. Only processes and methods that are general or typical need be presented.

Action upon Receipt of an Order. The making of a pair of shoes begins simultaneously in the cutting department and in the sole leather department. When an order is received in a modern and well-organized factory the order department records in the order book all the details regarding the samples upon which the order was secured. The shoe must be made upon these specifications in its course through the factory, and when finished it must conform to them.

In the order department each lot is given an order number. Tags bearing this number and the details regarding the preparation of the shoe upper, with*one tag for each two dozen shoes, are sent to the foreman of the cutting room. Other tags containing details about the sole leather to be used are sent to the foreman of the sole leather department. A third lot of tags is prepared for the direction of the foreman of the making or bottoming room, where are brought together, for

assembling, the various parts of the uppers prepared in the cutting and stitching rooms and of the bottoms prepared in the sole leather room.

The methods of making out the tags or tickets which are used as guides in the various rooms of the shoe factory vary in some factories. A clerk in the cutting room, for instance, may prepare them upon an order sent to him from the order depart-

ment. In all cases, however, the essential points given in the tags are the same. The tag specifies the sole, heel, upper, kind and quality, the stitching,

READ THIS TAG

TIP TICKET.

Pra. I Wl*h| 1 1It I 1 1111 3 13) I t J 11 I 6 I 61 I 6 I H | 7 1711 1

1101 IS I 201151 30 I 351 40 I IS | 60 | 651 601 661 701 To| 10

TRIMMING TICKET.

Pra. Width 1 It 1 31 3 31 4 41 6 5| 6 6) 7 j 71

|lo|is|lo|is|3o|351«|4s|so[s5[6o|e5|7o|7s|s0

J_L

LINING TICKET.

Pra. |WUih| 1 |lt|,l I It I 3|3l|4 |4l[6 | 611 *| 10 j lfi J 20 [3S I 30 [35 J I0|is|5o|ss|

Ml

|75ll0

I Il I I I I I f I 1 I I I 1 I

SOLE LEATHER TICKET.

-«!•—

fn. Wlith 1 U 1 H 1|31 I 111 5 I 61J 6 61 7

110 j 15 1201 26 j 30 [36 j 10] -46 1 &0 I 55] SO I 65 I 70

Itil

7s|l0

INSOLE TICKET.

Pra. |WUth| 1 I It I 3 111 I 3 | 3> | 4 j It | 6 , 6(j 6 | 6| j 7 j7t| 8 7s|«0

10 I IS 301 2SI 30 I 3SI 401 -46] 50 [55] GO | OS [701

STRAP TICKET. -

Prt j Width I 1 |lt| 3 [ll[3 |3l| 1 [lt| S |st[» |6l| 7 [7)| I

[10 I IS {. S30 1 at> j 30 I SSI 40 (« j 501 56 I 001 681 TO I TE| 80

J!

A Typical Shoe Tag

the style of last, bottom finishing, treeing, and packing. Above is presented a typical tag used in the shoe factory.

The Day Sheet. The despatch department has charge of the passing of work into the factory and of following it up through the factory. From the tags received by the order department the despatch offices prepares schedules or bulletins called day sheets. These sheets show accurately the details of each and every lot of shoes passing into the factory on a given day and also the scheduled time when the last lot of each day's work should pass a given point in the factory. The day sheet contains also supplementary information

showing the exact quantity of each of the various special items of product composing a particular day's work. The sheets are made in duplicate. One set is kept in the office and upon it are checked off records of the work as it proceeds through the factory. This sheet also contains the name of the customer for whom the shoes are being made, their price, and the name and commission of the salesman. Other sets go to the various factory rooms as guides and records of the day's work. The sheet used in the cutting room contains the specifications which constitute the cutting instructions, such as the kind of the upper stock and linings to be used, the price, and the number of square feet. On this sheet are recorded, also, all the details of the work of cutting as the cutting is done. The use of the day sheet is quite universal in shoe manufacture and it has done much to pro-

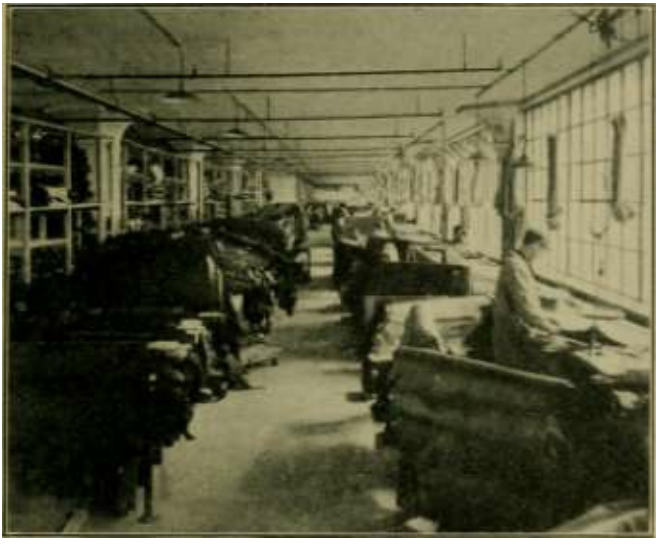
more efficient methods. On page 135 is presented a typical shoe factory day sheet.

The Upper Leather Room. The upper leather room is that division of the upper leather department in which leather stock is measured and sorted for the cutting room. The department includes the care, sorting, and cutting of the leather and other materials that enter into the upper of the finished shoe, and has three divisions, leather, linings, and trimmings, each being usually called a department or room.

Measuring Upper Leather. About two hundred different kinds of upper leather are now in use. They usually come from the wholesale houses or store rooms of the factory in boxes to the upper leather room. There they are taken from the boxes, counted, measured upon a machine, and stamped with the number of square feet in each piece. The machine used in measuring the upper leather is very sensitive to heat and cold, and must be adjusted every morning for the day's use. It records the exact number of square inches in the skin. The operator of it must be very careful and trustworthy. Upper leather constitutes a large part of the cost of shoe manufacture, and its economic use is absolutely essential in a factory.

The Leather Sorter. Leather sorting follows measuring and is equally important. The cutting

room tags calling for particular kinds of leather for particular lots of shoes are given to the leather sorter. He must be able to judge by experience exactly the amount and quality of leather required to cut each order, though the quantity may be



Upper Leather Stock-Sorting Department, W. H. McElwain Company, Manchester, X. H.

figured in the office. He tests the quality by doubling a skin along the back and passing his fingers over the folded edge. He rolls the skins selected or sorted for each lot of shoes into a bundle, attaches the ticket which he has used, and sends the bundle to the cutter. The leather sorter must himself have

served several years' apprenticeship as a cutter, so as to become used to the kinds, feel, and cutting value of leather. After sorting, the upper leather is sometimes weighed out by thickness into lots of definite weight, and placed on shelves in the room until needed for orders from the cutting room.

The Lining Sorter. There is usually, also, a sorter of the various kinds of cloth, such as twills and drills, used for the linings of shoes. These are inspected for their weave, strength, and chemical qualities. They are inspected both for acceptance by the factory and for grades for particular kinds of shoes. They are marked and labeled and put away in grades corresponding to intended uses. The lining sorter must usually have had training in a textile school.

The Positions in a Sorting Department. In the small factory one or two persons only may be employed in the work of measuring and sorting leather. Very many shoe factories, however, in which large and valuable quantities of stock are used daily, have •a fully organized sorting department.

The positions in a modern sorting department are as follows:

i. The Inspector, who examines the material selected by the sorters for particular uses, to see that it is rightly chosen.

2. The head sorter, who has charge of sorting.

3. Several or more leather and lining sorters.

4. One or two weighers of the sorted lots of leather.

5. Men who put up the work called for by the cutter's tags, selecting the leather according to the price given upon the

tag, and placing the bundles in their proper places for passage into the cutting room.

6. Girls who figure the allowances of leather called for by the tags and keep the cutters' accounts. This work must be accurately done and demands considerable ability.

The Lining and Cloth-Cutting Section. The cutting of cloth tops and linings was formerly done largely by hand. The hand worker places a pattern upon the cloth and cuts quickly around the edge of the pattern with a knife. He may cut the cloth in the single piece or in layers up to eight thicknesses. Such cutting is never accurate, and with the increased use of textiles in shoemaking it proves too slow a method. The dieing or dinking machine is being used more and more for the cutting of cloth parts. The die made in the shape of the usual pattern is accurate, and from twenty-four to forty thicknesses of cloth may be cut by it at one time, increasing the work of the section many fold. The cost in cases of die cutting is reckoned at about

one-tenth of that by hand cutting. Hand dieing or dinking is in practice to some extent.

As has been pointed out, the dieing or dinking section works entirely according to the specification of tags for each lot of shoes. Lots go through the room in pairs varying from one hundred and eight to one hundred and fifty in number for hand cutting, and about four hundred for machine dieing. The

usual lining parts to be cut or died out are, quarter lining, top band, inside stay, fly lining, back stay, and tip.

Patterns and dies are selected not only for each of these parts but for the particular style of shoe called for.

The Positions in the Lining and Cloth-Cutting Section. The usual positions connected with the cutting of cloth tops and linings are, the Foreman, the hand cutters, the machine dinkers, the hand dinkers, the pattern boy, the cloth and lining folders, the piece sorters, the inspectors, the cripple cutter, and the stDck man. There may also be an instructor, to aid the foreman in teaching new employees. After about one year's service on cloth and linings cutters may go to the outside or leather cutting room.

The Cutting Room. The cutting room is that division of the upper leather department in which the leather is cut, by hand or with a die, for the

upper parts of the shoe. It is the most important section of the large department. The cut parts finally go to the assembling room along with the linings from the lining room, and are there put together ready for the stitching room.

Cutting Shoe Trimming Parts, Upper Leather Supply Factory, No. 1 Building, Central Plant, Manchester, N. H.

The Hand Cutter. Cutting the upper parts of the shoe by hand was the method preceding the introduction of machinery, and is still in use, especially in the smaller and older factories, or in factories that handle small skins. It is an expert process demanding years of practice for the finest work,

and has been so satisfactory that it gives way but slowly to the use of machinery. The particular advantage of hand cutting, in addition to the more economical use of leather, is that the hand cutter is more likely to place his patterns so that the different parts of the skin may be cut according to the qualities needed for the different parts of the shoe. With the improvements in the tanning of leather so that more uniform

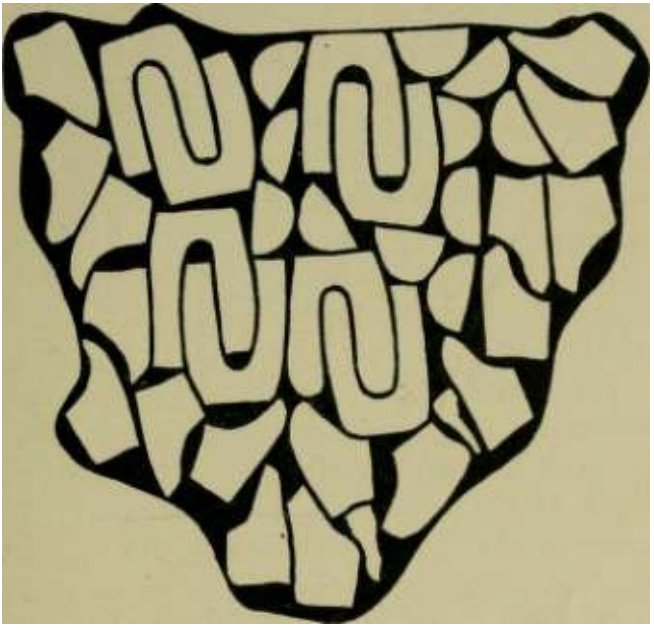
qualities are obtained, and with the increased demand for speed in cutting, large establishments are tending gradually to the use of machine dieing.

Hand cutting is done upon hard wood blocks made especially for the purpose, or thick " cutting boards " arranged at a convenient height for the workman to stand before them. He uses a short-bladed, keen-edged knife. It is a part of his training to know how to keep his board smooth and oiled regularly and his knife sharp.

The leather cutter is sometimes called " outside cutter," to distinguish him from the cutter of linings and trimmings.

The cutter receives a bundle or lot of leather with its tag from the sorting room, and the patterns called for by the tag from the pattern room. He lays out his patterns conveniently at hand in the order of large, medium, and small. He places one skin at a time upon the block. Placing a particular

pattern upon it, so that the part selected is best suited to the corresponding part of the completed shoe, he draws his knife skillfully around the metal edge of the pattern. This involves several or more motions with the dangers of cutting away from the



A Skin Showing How Patterns are Placed in Cutting

pattern and of cutting the fingers. The cutter uses his patterns alternately, or with variation of sizes and positions, so as to cut the skin most economically. Usually the waste parts are very small and unsuited to other purposes in the factory, except for

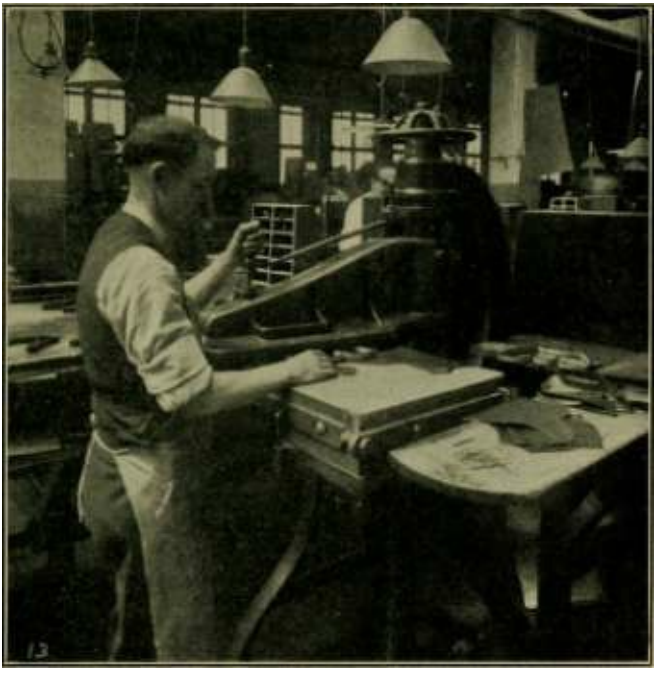
such trimmings as back straps and vamp stays. They are generally sold to be consumed in making leather substitutes, or for the oil they contain. The cutter lays out all his cut parts in lots and marks the upper piece by pattern, size, width and style. He ties up these lots with the tag and a sticker attached showing the case number, the number of pairs, and the size.

The work of the cutter is checked up in the sorting room, making an exact efficiency record for each workman, and the totals of cutting are placed upon the cutting room day sheet.

The outside cutter learns his trade by work upon cloth and linings or by service in leather cutting in a small factory.

The Clicking Machine. As has already been indicated, large shoe factories are coming to use machines for cutting leather, in some factories both the hand method and the machine method being found side by side. The machine, which performs a process formerly thought impossible except by hand, has a cutting board or block like that of the hand worker. A strong arm or beam swings from side to side over this block. A skin is placed upon the block and the operator of the machine sets a die upon the leather, just as the hand worker would place a pattern upon it. He then swings the arm of the machine over the die, which is pressed through

the leather by the automatic action of the machine. The arm then returns automatically to its full height. Dies may be used alternately as in hand work, so as to cut the skin economically. They are made in



Upper Leather Cutting Room, Showing Clicking Machine, W. H. McElwain Company, Manchester, N. H.

various designs and sizes with one die for each design and size. Thus it will be seen that machine cutting calls for a large number of dies. Each is about three-quarters of an inch in height, so that the oper-

ator can see clearly where he is placing it upon the leather, and of such light weight as not to injure the leather. Cutting is done upon one thickness only. One movement of the arm of the machine, guided by the operator, accomplishes what it would take the hand cutter considerable time to do in passing

his knife entirely around the edge of the. pattern. All pieces cut by a die must be identically the same, while in hand cutting there would necessarily be some variation in size. The dies used for the vamps mark the location of the toe cap and Blucher foxings that may be added later. The cut parts are treated as in hand work, and sent on to the next operations.

The die-cutting machine is called the " clicking machine," and is one of the most important recent innovations in the making of shoes. An illustration of this machine is on page 145.

The Counting, Marking, and Skiving Department. In a small factory many of the minor operations of shoemaking are done in some part of the rooms in which the related major processes are performed. Such minor operations may employ but few people. In the larger factories, however, they become very important because of the large number of shoes made daily. They then employ many persons and are carried on in separate rooms and departments. Such is the department in which the counting, marking, and skiving of the pieces coming from the

cutting room are done. The cutter, or some other employee in the cutting room, has marked only the top piece of each lot. In this department girls untie the lots, count them to see that

the number called for by the tag is present, and mark the size

Operating the Skiving Machine

upon each part. The employees of this department, except for a machinist who has charge of the machines, are regularly girls and women. The entire department is sometimes called the skiving department, from the chief process in it.

Skiving. The edges of the upper leather which

are to show in the finished shoe are " skived," or beveled to a thin edge which can be folded in so as to give a more finished appearance to the completed shoe. This work is done by girls upon skiving machines. Such edges on thick leather are sometimes stained the color of the leather itself

instead of being skived. The skived edges are covered with a coating of cement, and placed in a machine which folds and presses them at the same time.

Nicking. All curved edges of upper leather parts are nicked or cut with little notches by girls upon nicking machines. This is done so that such parts may be folded in evenly and smoothly in stitching the shoe. Sometimes edges which will show in the completed shoe are scalloped.

Dieing Out Straps. Straps for Oxford shoes and button flies are usually died out by hand, by the use of a mallet, in this department, rather than by the cutter in the cutting room, where, being the smallest parts, they cause some delay in cutting.

Positions in the Skiving Department. The positions in the skiving department are, the Forewoman; floor girls, who give out work, gather it up, and check it off as it leaves the room; counters and markers; skivers; nickers and scallopers; edge stainers, and the machinist.

Assembling Department. The upper parts of the shoe come on trucks from the skiving room to

the assembling department. Here are many boxes in which the lots are placed according to numbers, with four tags for

each order, the tag for the outer, upper part of the shoe, for linings, for trimmings, and for tip. In each box are placed the parts necessary for the complete upper, by adding to each lot what its tag calls for. Linings are marked upon a stamping machine with size, width, and case number. When all parts have been assembled they are divided for the various sections of the stitching room. For instance, quarter linings, top bands, button flies or side stays go to the tip-stitching section; tips go to the tip-stitching section; and the outside parts, vamps, vamp linings, and tongues, go to the vamping section.

Positions in the Assembling Department. The positions in the assembling department are, the Foreman, floor girls, girls for casing up, for stamping linings, and for arranging tags in order of precedence, and a stock boy.

Time and Pay Statistics in the Cutting Department. At the end of this and other chapters on factory departments are presented statistics selected from Bulletin Number two hundred sixty of the United States Bureau of Labor Statistics, showing average and classified full-time hours per week, and rates of wages per hour, and average full-time weekly earnings in boot and shoe manufacture

throughout the country from 1907 to 1918, and by states for 1918.

The figures here given are for a selected number of

establishments, but may be regarded as representative of the entire industry, as according to the census of 1910 more than ninety-seven per cent of the total number of employees in the industry were found in the states from which the information was secured.

Among other things, it will be observed by Table X, on pages 151 and 152, that hand cutters, whose work is more exacting than that of machine cutters, received in 1918 forty-eight and four-tenths cents per hour, or $25.06 a week; while machine cutters received forty-four and four-tenths cents per hour, or $23.04 per week. It will be seen, also, that male skivers in 1918 received forty-two and three-tenths cents an hour or $21.55 a week; while female skivers received twenty-six and seven-tenths cents an hour, or $14.73 a week. In Table XI on page 153, may be seen the variations of earnings in these operations in the great shoe manufacturing centers of the country.

Table X* Average and Classified Full-Time Hours per Week and Rates of Wages per Hour, and Average Full-Time Weekly Earnings, in the United States, by Years, 1907 to 1918. [The figures set opposite each group of years are for identical establishments.

When a second line is shown for 1918 it contains all data secured for 1918 whether

or not comparable data were available for 1017.]

Cutting Department

* From Table A — Wages and Hours of Labor in the Boot ond Shoe Industry, iqoj to 1918. United States Department of Labor, Bureau of Labor Statistics.

THE SHOE INDUSTRY

Table X — Continued

Occupation, sex, and number of establishments

$*

Employees whose full-time hours per week were —

60

56 establishments..

66 establishments..

Skivers, upper, machine, male: 12 establishments..

28 establishments.. 32 establishments..

22 establishments.. 19 establishments.. 18 establishments..

23 establishments..

Skivers, upper, machine, female: 13 establishments..

49 establishments.. 60 establishments.. 67 establishments.. 65 establishments.. 72 establishments.. 104 establishments 121 establishments

$17.86 23.88

15-80 17-15

15.98 15-73

15-41 16.23

16.26 16.47

17.21 17.87

17.81 22.31

10.75 10.92

9.94 9-97

9-97 10.54

10.58 11.38

11.29 11-35

n.16 11.09

11.23

13-71

in

2 618

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26

X 3I7

^es

s 4

5S

100 84

UPPER LEATHER DEPARTMENT

153

Table XI* Average and Classified Full-Time Hours per

Week and Rates or Wages per Hour and Average Full-Tlme Weekly Earnings, by States, 1918.

Occupation, sex, and State

£.2

16

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is

Cutting Department

Cutters, vamp and whole shoe, hand, male:

Illinois

Maine

Massachusetts

Minnesota

Missouri

New Hampshire

New Jersey

New York

Ohio

Pennsylvania

Wisconsin

Other States

Total

Cutters, vamp and whole shoe, machine, male:

Massachusetts

Missouri

New Hampshire

New York

Ohio

Pennsylvania

Other States

Total

Skivers, upper, machine, male:

Massachusetts

New York

Other States

Total

66

161

43

914

65

320

61

46

285

153

194

32

539 142 170 140 64

96

50.9

54-1 5I-I 54-7 5°-4 50.6 S5-o 51.6 54-6 55-4 54-5 54-4

52.0

S0.3 S2-8 52.2

$0,552

•493

503 394 499 391 347 525 496 383 385 358

So.484

•47° •347 .460 •449 •392 .308 .466

$0,444

.421 .641 •311

$0,423

$28.02 26.67 25.60 21-54 25.10 19.78 19.06 27.09 27.11

21.28 21.00 19-45

$25.06

2403 19.78 2317 21.94 21.58 16.86 25.26

$23-04

21.15

33-88 16.22

$21.55

*From Table C — Wages and Hours of Labor in the Bool and Shoe Industry: igo7 to iqiq. U. S. Bureau of Labor Statistics.

THE SHOE INDUSTRY

Table XL* — Continued. Average and Classified Full-Time Hours per Week and Rates of Wages per Hour and Average Full-Time Weekly Earnings, by States 1918.

Occupation, sex, and State

Number of establishments	Number of employees	Average full-time hours per week	Average rate of wages per hour

"■5 a

Cutting Department

Skivers, upper, machine, female:

Illinois

Maine

Massachusetts

Minnesota

Missouri

New Hampshire

New Jersey

New York

Ohio

Pennsylvania

Virginia

Wisconsin

Other States

Total

$0,240 .310 .286

.210

•249 .306

■215

.296

•23s •234 .231

.221 .162

$0,267

$12.71 16.74 14.74 II.18 13-02

15-36

11.67 14.81

n-73 12.39 12.48 "•95 8.72

$14-73

* From Table C. — Wages and Hours of Labor in the Boot and Shoe Industry: igoy to 1 gig. U. S. Bureau of Labor

Statistics.

CHAPTER IX THE STITCHING DEPARTMENT

The stitching department is that division of the factory in which the outer parts of the upper of the shoe, the linings, and the trimmings are sewed together upon machines, ready for putting upon the last. In some factories this division is called the " fitting room." Female employees generally work in this department, but at present men are being employed more and more on the vamping machines and other heavy parts of stitching. In a factory having 5,000 employees about 1,400 are found in the stitching department. The machines used in the stitching room are similar to the ordinary sewing machine used in the home.

Variations in Stitching Room Processes. Methods and details in the stitching departments differ more than in the cutting and other departments of the shoe factory, because of the many parts composing the upper of the shoe. There are more processes involved in the making of women's shoes, with the constant striving after style and effect, than in men's shoes, in which plainness and serviceable qualities are desired. Processes may be modified, also, in

making children's and infants' footwear. Different kinds of shoes, as high, low, and pumps, require variations in the

methods of sewing the various parts of the upper. Altogether the stitching department involves a large number of processes of minute detail

A Division of the Stitching Room

and possibility of variation. The generally prevailing methods are here presented.

The Number and Divisions of the Parts to be Stitched. For the uppers of an ordinary pair of button boots, as an example, there are forty-four different pieces of material. The stitching is done upon many of these parts simultaneously before the

upper is ready for lasting. The size is marked upon every part. The linings and the trimmings are given to one division of operators, the outsides to another, and the vamps and tips

to still another division. All these parts meet again when each has been sewed, and are inspected and sent on to the lasting room.

The Divisions of This Department. The natural divisions of this department are shown in the chart on page 158. They are, the Lining department, the tip department, closing and staying, foxing, top stitching, or closing on and top stitching, and the button hole, vamping, and toe closing department.

The Lining Department. In the lining department various parts of the lining are pasted and sewed together in preparation for the tcp stitching department, where the lining as a whole will be sewed to the upper of the shoe. Each operation here spoken of may be a single process or may represent several minor processes. First the lining is closed or sewed in a seam, and taped, or stayed up and down the heel. The top band is sewed on. The button fly, which has a reinforcement in the man's shoe, is also stitched on. A lining is stitched upon the tongue for some shoes. The vamp lining is cemented merely to hold it in place for later sewing. Labels are stitched on the lining of the inside of the heel for Oxford shoes, and on the inside of the top

CHART OF THE STITCHING DEPARTMENT

STITCHING DEPARTMENT

Lining Department

Tip Department

Closing and Staying Department

Foxing Department

Top Stitching Department

Button Hole Department

Vamping Department

Toe Closing Department

of the lining for boots. The more common kinds of boots, for instance, are, the button, the Polish, the Blucher; of low shoes, the Oxford and the pump.

Positions in the Lining Department. The usual positions in the lining department of the stitching room are, the Superintendent, the forewoman, the inspector, operators on the closing of linings, on the staying of linings, on sewing of top bands, and on attaching labels, the floor girls, and a cripple girl who attends to all imperfect work.

The Tip Department. The tip department is that section of the stitching room in which the tip receives special preparation for its place in the complete upper, and in which it is sewed to the vamp. Tips come from the cutting room tied in bunches separate from the other parts of the shoe. In the tip

department they are skived, perforated, and fitted with linings according to use on particular vamps, or, in other words, on shoes of particular styles. Usually a box to give reinforcement and style to the tips is cemented inside of it before the lining is inserted, and before the tip is stitched to the vamp. The tip may be skived and folded in, perforated, nicked, scalloped, or plain, each process involved belonging to this department. The lining is cemented in, taped over seams, and pressed firmly in place upon a machine, and the whole is top-

stitched on a machine, through leather and lining, just below the line of perforation. Then the tip

Operating the Tip Punching Machine

is stitched above the perforation to the vamp of the upper; and this part of the upper is ready for the vamping department.

Perforating. Perforating deserves special mention since it gives style to the tip, and is of itself an interesting process and a good example of intricacy in shoemaking processes. A series of ornamental perforations is stamped by a combination of small dies upon the " power tip press " or

upon the " perforating machine." The holes thus stamped take particular styles which are known in the shoe factories by numbers. For instance, perforation " number 69 " consists of a large hole and a small one alternating in a line near the edge of the tip, over the top, thus: O0O0O0, and " number 70 " consists of a large hole alternating with two small ones, thus: O00O00O. The size of the holes may vary. If you will look at the tip of your shoes you will probably find one of these styles or a variation of them.

The machine feeds itself automatically, dieing the full perforation accurately at one stroke for each tip, as the tips pass through in line upon a moving band of paper, which prevents dulling the die. This machine is used also for perforating larger parts of shoes, such as vamps, foxings, and ornamental " winged tips."

Positions in the Tip Department. The positions in the tip department are numerous and may be shown more clearly, as will other departments having many positions in the following pages, by a numbered

list as follows, using the terms which are common in the factory:

i. The Superintendent, in a large factory.

2. Forewoman.

3. Quality Inspector.

4. Lining Closers.

5. Stayers.

6. Toe Piece Ironers.

7. Tapers.

8. Reinforcers.

9. Tip Markers.

10. Toe Lining Reinforcers. n. Tip Pressers.

12. Vamp Pressers.

13. Vamp Perforators.

14. Box Cementers.

15. Stitchers of tongue to vamp.

16. Tip Perforators.

17. Tip Blackers.

18. Stitchers of tip and vamp.

19. Floor Girls.

20. Cripple Girls.

21. " Hustle Girls," who look up the dates upon the tags and keep orders moving in their proper sequence.

The Closing and Staying Department. The closing and staying department deals with cementing,

sewing and securing the seams of the top of the upper, the part above the foxing and toe of all kinds of shoes, following the work done upon the linings and tips. First, the button fly is pressed, then closed or sewed to one quarter and the two quarters of the top are sewed together. The top piece is cemented on the inside of the large quarter, which bears the button fly, and the quarter is stayed. The top of the button Oxford is ironed out at the heel seam, and a reinforcement ironed upon the button fly. The Blucher Oxford is nicked and pressed. A paper reinforcement is ironed upon the inside of the top of the circular pump. Bows of various kinds and colors are made by the machines for Oxfords, and fastened upon them by a machine which drives a metal reinforcement into the bow. Canvas stays are put in the top of Oxfords. A long vamp is reinforced for eyelets, and a stay is cemented in when blind eyelets are to be inserted. Perforations are sometimes covered with imitation reinforcements on the inside, or stitched around the outside. Perforation upon the top has tape placed on the inside and stitched underneath.

Buckle straps and instep straps are attached to some styles of shoes.

There are many such operations in this division of the stitching department, according to the particular kinds of shoes made in a factory. Each style is kept separate in going through the depart-

merit. Stitching machines are now made for use upon certain styles and parts of shoes only, specialization in machinery extending to the most minute parts of processes throughout the factory.

Positions in the Closing and Staying Department. The usual positions in this department are as follows:

i. Forewoman, or assistants to foreman.

2. Inspectors.

3. Instructor.

4. Closers.

5. Label Girls and Cementers.

6. Button Fly Pressers.

7. Button Fly Reinforcers.

8. Stayers.

9. Toe Piece Reinforcers. 10. Cementers and Pressers. n. Floor Girl.

12. Checker Girl, who checks off all numbers of lots so that it may be known when the parts are all done and have gone to the next department.

The Foxing Department. The foxing department is one of the smallest divisions of the stitching room. The foxing is a little piece of upper leather below the quarters on each side of the heel, put on all kinds of boots and Oxfords. Foxing is used on both the high and the low styles of footwear. It is both plain and ornamented, according to the style and quality

of the shoe. Back straps and fly stays are stitched upon the quarters to which the foxing is attached, and then the foxing, ornamented with perforations in this department, if need be, is stitched upon the quarters, sometimes with one row of stitching and sometimes with two rows. The operations are the same with canvas as with leather uppers. The work when done and checked off on the day sheet goes to the top stitching department.

The ordinary Polish shoe, not the Blucher, and the Oxford shoe, both Blucher and common, have a long vamp and no foxing.

Several related or similar operations, also, are performed in the foxing department, such as sewing loops at the top of the back of the shoe, on men's shoes, and sewing on buckle straps.

Positions in the Foxing Department. The usual positions here are these:

1. Forewoman, or assistants to foreman.

2. Teacher.

3. Inspector.

4. Perforators. 10. Floor Girls.

5. Back Strap Stitchers. 11. Cripple Girls.

6. Side Stay Stitchers. 12. Checker Girls.

7. Binders.

8. Button Fly Face Stitchers.

9. Foxing Stitchers.

The Top Stitching Department. The top stitching department is the division of the stitching room in which the tops, the leather upper part, coming from the foxing department, and the linings, from the lining department, are sewed together.

Quarters and linings are first matched upon tables and tied together in bundles, according to tag numbers. This work is done by floor girls, who give the bundles thus matched to the machine operators. In some factories vamps are sewed on at the same time as the tops and linings are sewed together.

The methods of the department vary, as in other sections of the factory, according to the style of shoes being made. Generally the quarters and lining are put together back to back, or wrong side out, and stitched along the edge of the top. Then the top is turned and the seam is pounded out so that the edge of the leather on the right side comes out true and flat. Then this part goes to the top stitcher, who sews it all around except at the bottom where the vamp is still to be attached. The side of the quarter on which the buttons are to be sewed on the button shoe is pinked or notched upon the edge in case of a raw edge of the lining and the leather sewed together. Usually in the case of canvas shoes vamping is done in this department before top stitching.

More men are found in this department than in the other divisions of the stitching room because the

work is sometimes heavier and more exacting, calling for considerable strength when followed from day to day, as well as for skill. The parts must be sewed, carefully turned and thoroughly beaten, and sewed again in finished form, making altogether, perhaps, the most difficult work of the stitching room, and the department is the largest division of

the stitching room.

Positions in the Top Stitching Department. The positions in this section are the following:

1. Forewoman.

2. Teacher.

3. Inspector.

4. Operators of closing on machines.

5. Operators for turning and pounding top.

6. Top Stitchers.

7. Vampers.

8. Floor Girls.

9. Cripple Girls.

The Button Hole Department. The button hole department includes the making of button holes and the inserting of eyelets. The tops of button and of lace shoes come from the top stitching department to this department. The small quarter under the button fly is pinked, and the fly is marked for button holes by means of a perforated pattern through which the places for buttons are marked by hand

with a pencil or yellow crayon. Then the button holes are inserted by a power machine which cuts the hole and works it around at the same time. In eyeleting the upper is marked by hand for the eyelet. Then the eyelet is inserted on a machine. A machine has recently come into use which inserts eyelets in both sides of the top at the same time. In the case of " blind eyelets " a hole is stamped through the leather, lining, and reinforcement. The leather is then held back by the operator and the eyelets are stamped through the lining and the reinforcement, the leather only showing on the outside of the hole. In some factories blind eyelets are inserted as a single process on an automatic machine. In men's high lace shoes hooks are inserted by a machine above the rows of eyelets. Raw edges are blacked or colored so as to make the edge of the lining resemble the leather.

Pairs of tops are now examined for matching and are tagged by sizes ready for vamping.

Positions in the Button Hole Department. The usual positions in the button hole section are as follows:

i. Forewoman.

2. Teacher.

3. Inspector.

4. Quarter Pinkers.

5. Button Hole Markers.

6. Button Hole Workers.

7. Machine Eyeleters.

8. Button Hole Finishers.

9. Button Hole Trimmers.

10. Operators for Cording the cloth button shoe.

11. Edge Blackers.

12. Girls for Matching and Tagging pairs.

13. Floor Girls.

14. Cripple Girls.

The Vamping Department. The vamp is the lower, front part of the shoe upper. It is the most important part of the upper and should be cut from the best of leather. The " cut off vamp " extends only to the shoe tip. The whole vamp extends from toe to heel with a seam at the heel only. Vamping consists in stitching the vamp to the quarters of the top. While some vamping may be done in the top stitching department, the process itself is an important one, and is a separate section in a factory. Vamps are first centered by being folded and marked in the center of the throat. Then the vamp is stitched

to the quarters, each style of shoe calling for its special process. Usually leather parts only are sewed, the lining being held back.

Vamping is the most painstaking work of the stitching room and the best paying. Judgment and carefulness are absolutely essential to the operator. Three-fourths of the vampers are men. Hand

strength is necessary in the heavier kinds of vamping, to pull and hold parts in place while they are being stitched, and to guide the work through the machine.

Positions in the Vamping Department. The few positions of the vamping department are, the Superintendent, foreman, man instructor, inspector, vampers, floor girls, cripple girls, and checker.

Lacing Uppers on the Ensign Lacing Machine

The Toe Closing Department. The toe closing department is the final division of stitching. The toes of all linings are made in two pieces. When the toe closing department is reached tops and linings have been stitched together and vamps have been

sewed to the tops. In the toe closing department the leather vamp is held back and the two parts of the toe lining, one being laid flat upon the other so as to avoid a thick seam, are doubled stitched. This is a quick and easy operation.

Several other processes best done at this stage of shoemaking are performed in this department. In button shoes

the side of the top which is to bear the buttons is marked for the buttons through the holes of the other side, by hand. Then the buttons are sewed on by a machine operator. Then comes the process of barring, or inserting a few stitches on a machine just below the buttons and above the vamp. Button Oxfords are fully buttoned, high button shoes only part way, in preparation for lasting. Laced shoes are laced by hand or on a machine. Lots are made ready by tags and numbers for the lasters.

Positions in the Toe Closing Department. The positions in this division are, the Superintendent, forewoman, inspector, toe closers, markers for buttons, button sewers, operators of barring machines, girls for buttoning and lacing shoes, floor girls, cripple girls, and packers who sort cases of lots of shoes for lasting.

Operating Stitching Machines. The stitching department deserves special mention on account of its magnitude, intricate processes, and peculiar machines.

Machine operators in the stitching room generally learn on inside work ; as linings, or by work upon cheaper leather parts, or by low grade work. In certain seasons of the year there is a transfer of operators from department to department, according to need. Some operators know how to run a number of machines, frequently being taught to run a second one as if just entering the factory. The difficulty of handling a power sewing machine, as of a power machine in

general, is to know when to start and when to stop the machine. On all machines the start is made by pressing the toe, and the stop by pressing the heel. Sometimes a factory has a special room where not only the processes of stitching take place but all other processes as well, for the making of special " hurry orders " of shoes.

Some automatic machines produce in operators, especially in the case of girls, the particular movement of the machine so that the operator responds to the motion, swinging" or jumping the entire body or exhibiting a nervous, spasmodic action. This is especially noticeable in running the barring machine in which the part bearing the needle rises and springs towards the operator at each operation, and upon machines having an eccentric movement. In such cases operators are usually transferred in time to different or less injurious machines or processes.

THE STITCHING DEPARTMENT

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Table XII. * Average and Classified Full-Time Hours per Week and Rates of Wages per Hour, and Average Full-Time Weekly Earnings, in the United States, by Years, 1907 to 1918.

Fitting or Stitching Department

* From Table A. Wages and Bouts of Labor in the Boot and Shoe Industry: iqo? to iqi8. U. S. Bureau of Labor Statistics.

THE SHOE INDUSTRY

TABLE XII — Continued

THE STITCHING DEPARTMENT

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TABLE XII. — Concluded

THE SHOE INDUSTRY

Table XIII. * Average and Classified Full-Time Hours per Week and Rates of Wages per Hour, and Average Full-Time Weekly Earnings, in the United States, by Years, 1907 to 1918.

Fitting or Stitching Department

Top stitchers or un-der-trimmers, female: 17 establishments..

S3 establishments... . 73 establishments... . 82 establishments.... 77 establishments... . 77 establishments... . 123 establishments...

135 establishments...

Button fasteners, female: 26 establishments... .

72 establishments....

66 establishments... .

60 establishments... .

51 establishments... .

64 establishments... .

1907 1908 1909 1910

1910 1911

1911 1912

1912 1913

1913 1914

1914 1916

1916 1918

1918

1911 1912

1912 1913

1913 1914

1914 1916

1916 1918

1918

144 156 164

721 742

911 95°

1,033 1,070

1,033 1,005

1,004 1,101

1.392 1,262

1,364

205 232

136

85

S6.3 S6.3 S6.3 56.0

S6.9 56.8

S6.7 54-9

54-9 54-6

54-5 54-1

54-1 54-1

54-o 5i-5

51.6

5°-4 55-9

55-3 54-8

54-7 53-7

53-7 53-9

53-7 32-7

$0,185 .190

.196 .200

.198 .210

.211 .211

.212 .214

.220 .287

.285

$10.42 10.70 11.03 11.20

10.69 10.83

IO-95 10.82

10.81 11.47

11.46 H-39

11.46 n-55

11.84 14.61

9.78 IO-9S

10.70 10.57

10.32 11.28

11.30 n-95

12.06

30 31 31 32

in 109

183 521

572 573

558 524

5°9 61 2

811

358

169

26

203 165

185

27

* From Table A. Wages and Hours of Labor in the Bool and Shoe Industry IQ07 to iqi8. U. S. Bureau of Labor Statistics.

THE STITCHING DEPARTMENT

TABLE XIII. — Continued

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Fitting or Stitching Department

THE SHOE INDUSTRY

Table XIII. — Concluded

THE STITCHING DEPARTMENT

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Table XIV. * Average and Classified Full-Time Hours per Week and Rates of Wages per Hour, and Average Full-Time Weekly Earnings, by States, 1018.

Occupation, sex, and State

Number of establishments

Number of employees

Average

full-time

hours per

week

Average

rate of

wages per

hour

Average full-time weekly earnings

* From Table C. — Wages and Hours of Labor in the Boot and Shoe Industry: igo7 to iqi8. U. S. Bureau of Labor Statistics.

THE SHOE INDUSTRY

Fitting or Stitching Department — Continued

THE STITCHING DEPARTMENT 181

Fitting or Stitching Department — Continued

CHAPTER X

THE SOLE LEATHER DEPARTMENT

Its Nature. As the upper leather department is sometimes called upper stock fitting, so the sole leather department is often called bottom stock fitting. It deals with the preparation of the bottom parts of the shoe. These are:

i. Soles.

2. Insoles.

3. Counters.

4. Toe Boxes.

5. Heels.

The Preparation of Sole Leather Parts. These parts may all be prepared in # specialized factories and sold to shoe factories, or large shoe concerns may themselves have special departments for the preparation of these parts from the sides of sole leather. Briefly, in either case the sole leather is dampened by dipping it in water to make it cut more easily, and the desired parts are cut out in the rough by means of dies in "dieing-out machines." The shoe factory, when buying such parts, usually buys them in this condition. The cut parts are then

made to conform nearly to the desired shape for shoemaking by rounding them in the " rounding machine." This machine uses a pattern of the required shape and by means of a knife cuts around the sole in conformity with the pattern. The outsole is passed through a heavy rolling machine to press the fibers very closely together, so as to increase the wear of the shoe as did the hammering of the old time shoemaker. The

sole is then passed through a splitting machine which reduces it to an even thickness. The insole, or inner sole, is made in the same way as the outer sole but of lighter leather. These and other parts of the shoe bottom will be spoken of again in the following pages.

The Division of Bottom Stock Fitting. There are three important divisions in the bottom stock fitting or sole leather department. That dealing with the divisions of the insole depends upon two special methods of shoemaking as described in Chapter VIII. The three divisions are the following:

1. McKay Insole Division.

2. Welt Insole Division.

3. Outer Sole Division.

The McKay Insole Department. In the making of McKay insoles material is usually bought in roughly blocked form. Since light leather is used regularly for the inner sole in this method of shoe-

making the blocks are first dipped in a solution of glue, so that when dried they will become somewhat hardened and strengthened. They are then died out or dinked upon a machine in sizes and widths, with a full set for each style of shoe to be made. They are cased up by girls, according to the

accompanying tags.

Positions in the McKay Insole Department. The few positions here are, the Foreman, girls for dipping the insoles in glue, dinkers or operators of dieing out machines, girls for casing up soles, and a checker girl.

There may be other operations in this division, such as " stitch slashing " and reinforcing the heels of insoles.

The Welt Insole Department. Inner soles made by the welt method are of two kinds, leather and reinforced. The all-leajher sole must be of good quality, and at least of a standard thickness. The reinforced sole may be of poorer quality and thinner, yet of a fixed standard. In such soles the leather is reinforced or strengthened by a covering of canvas cemented firmly upon it. For welt insoles the leather is bought in full side stock, that is, uncut, and in the rough block form. The soles are first dinked out as in the McKay division, and sizes are stamped upon the heels by hand. Then the heel seat is cut across in a machine to indicate the position of the front of the heel. Girls usually perform this operation because of their quickness of hand.

One person may cut the heels of 10,000 insoles in a day. This is a good illustration of a process in which scarcely more than one simple motion is involved.

Channeling. The purpose of the welt method is to give a smooth, even inner sole in the finished shoe. To effect this the sole must be either pasted in or attached on its under surface. The latter is accomplished by passing the insole through the Goodyear channeling machine which makes incisions, or a double " lip," with two knives acting at the same time. A slit about one-half inch deep is cut from within along the edge of the insole. Then the channel thus made is opened up on a lip-turning machine, forming a ridge around the outer edge. The welt is later sewed to this lip or shoulder.

Slashing. The welt inner sole is sometimes slashed or cut across the ball of the foot on the under side, to make it flexible.

Wetting. Leather inner soles are passed through heavy rollers, in which they are wet and compressed at the same time. They are now sorted and packed to go to the lasting room.

Randing. The rand is a strip of leather made thin at one edge. It is attached to the heel part of the sole, or later to the heel itself, so as to fill what would otherwise be an open space between the sole and the heel.

Reinforced Insoles. The reinforced insole is

characterized by lightness and strength. Soles which are to

be thus treated are first died or stamped out as in other cases. They are channeled with a single lip which is turned up to indicate the place of the canvas reinforcement. They may be slashed and dampened as in the case of the leather sole. They are then dried under a large fan or in a blower, having been cemented by a brush on the surface inside the lip.

The Canvas Reinforcement. A large roll of canvas of suitable width is run through a cement box and over a great reel, one side of the canvas only being wet with cement. The canvas dries upon the reel, is taken off in a roll, and cut in the proper reinforcement lengths, which are later fitted by hand upon the leather insole of the lip and " formed " or rubbed thoroughly into the space by a machine. The surplus canvas is then trimmed off at the edge of the lip. The soles are then cleaned, inspected, sorted, and packed up for the lasting room.

Positions in the Welt Insole Department. The positions in this department, including those already indicated and several others which may be found in most factories, are as follows:

i. The Superintendent.

2. Foremen.

z. Assistant Foremen.

4. Quantity Man, who makes a study of the volume of work done in the department.

5. Quality Man ; who inspects work for quality.

6. Dinkers and Stampers.

7. Heel Markers and Cutters.

8. Channelers.

9. Slashers.

10. Lip Cutters.

11. Lip Turners.

12. Toe Cutters.

13. Wetters and Cementers.

14. Heel Counters.

15. Randers.

16. Canvas Cutters.

17. Canvas Attachers.

18. Canvas Formers.

19. Canvas Trimmers.

20. Sorters and Packers.

21. Floor Boy.

The Outer Sole Department. The treatment of outer soles is largely like that given to inner soles. The main processes are much the same with a few additional processes and features. Outer soles are first cut into the rough block form and are then dinked out, or " rounded " by being cut by pattern upon a machine. Sizes are stamped upon the heel. They are shanked out and the heel seat is smoothed

by a machine. They are then wet and moulded upon a high pressure machine to the shape of the shoe bottom, being at the same time hardened by the pressure. A feather edge is given to the fore' part and heel seat of the soles which are to be treated by the McKay process. Channels are cut and turned in those to be treated by the welt process.

Positions in the Outer Sole Department. The positions, in this department, from the superintendent down, are practically the same as those of the insole department, on page 186, with the exception of cementers and canvas workers.

The Counter Department. As has been said already, small parts of the shoe, such as the counter, toe box, and heel,

presented briefly at this place, are largely manufactured in special factories and purchased in quantity by the shoe companies. Large factories, however, or shoe manufacturing companies operating a number of factories, usually have departments for making their own counters, toe boxes, heels, and other minor parts. Opportunities for employment in the specialized factories depend mainly upon the magnitude of manufacture, the large number of parts turned out daily requiring little skill but many hands in the making.

The counter is a stiffening in the back part of the shoe between the leather and the lining, and lasted with the rest of the top to the bottom of the shoe.

Its purpose is to prevent running over at the heel. It is made of sole leather, leatherboard, leather fiber, or similar substance that may be easily worked and yet left firm after treatment, and sometimes of metal in the case of heavy shoes.

The counter is died out and its edges skived thin. It is treated with shellac or glue and molded into shape.

The Toe Box Department. The toe box is a reinforcement placed in the toe of the shoe to give permanency of shape or a distinctive style. It is usually made of sole leather, but it may be made of leatherboard, pasteboard, canvas, linoleum, celluloid, or of other materials which can be easily worked

and made to retain their shape. The box is died out, skived upon the part above the toe, soaked in shellac or gum so as to be stiff when dry, and usually molded to the desired form, ready for use in the lasting room.

The Heel Department. In Chapter XIV, upon the terms used in shoemaking, an explanation is given of the heel and its varieties. So it is necessary here to speak only of the materials and processes of its manufacture.

Heels are usually made of the poorer parts of sole leather, including the remnants from counters and toe boxes, leatherboard, " hydite," or other leather substitutes, and of wood.

The Processes of Making Heels. The leather is first " fitted/' which consists of skiving and rolling. It is skived by being run through a machine to give it an even thickness, and rolled to make it hard and firm. It is then weighed and given to the cutter. Each operator on the cutting or dinking machine has five or six dies and cuts the leather as economically as possible into various sizes for heel lifts. These are then sorted by hand into four grades, and put into bins according to sizes, ready for " heel building." The heel builder receives a tag calling for so many heels of a certain size and and gets from the bins the lifts required by the size. The lifts are placed one upon another, by a gradation of sizes, up to the height necessary for the heel. The pile is pasted or glued and a nail is driven through by a machine to hold it firmly

together. Many of these piles, or heels in the rough form, are put upon boards and placed in the fiat press where they remain for twenty-four hours under high pressure. They are then put into a compressing machine which molds them into any desired shape. After this rands are tacked upon them, when not first attached to the heel seat, so that they will fit closely upon the heel seat of the sole of the shoe. Then the front part or breast of the heel is cut off smoothly, as this can be done better before the heel is attached. Heels are then sorted, gauged for height, trimmed

upon their edges, put into bags, and stored away until called for by the making department. A top piece, or lift of superior leather is put upon the heel later in the making department.

Positions in Heel Making. The usual positions in a heel factory or in the heel department of a modern shoe factory are as follows:

1. The Superintendent.

2. Assistant Superintendent.

3. Foreman.

4. Assistant Foreman.

5. Skivers.

6. Rollers.

7. Cutters.

8. Weighers.

9. Heel Lift Sorters.

10. Heel Lift Gaugers

11. Heel Builders.

12. Flat Press Men.

13. Rand Makers.

14. Rand Tackers.

15. Compressors.

16. Heel Sorters.

17. Heel Repairers.

18. Lumpers.

Employees in the Sole Leather Department. The heavier processes in this department and the larger

machines require men as operators, but the many lighter

processes and the handling of small parts make possible the employment of large numbers of boys and girls and women. In the average factory this department usually has about an even division of male and female employees, standing next to the stitching room in its proportion of the latter.

THE SOLE LEATHER DEPARTMENT 193

Table XV. * Average and Classified Full-Time Hours per Week and Rates of Wages per Hour, and Average Full-Time Weekly Earnings, in the United States, by Years, 1907 to 1918.

Occupation, sex, and number of establishments

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Employees whose full-time hours per week were—

CO ,.

Sole Leather Department

* From Table A. — Wages and Hours of Labor in the Bool and Shoe Industry: IQ07 to 1918. U. S. Bureau of Labor Statistics.

THE SHOE INDUSTRY

Sole Leather Department

THE SOLE LEATHER DEPARTMENT 195

Table XVI.* Average and Classified Full-Time Hours per Week and Rates of Wages per Hour, and Average Full-Time Weekly Earnings, by States 1918.

Occupation, sex, and State

Number of

establishments

Number

of

employees

Average

full-time

hours per

week

Average

* rate of

wages'per

hour

Average full-time weekly earnings

Sole Leather Department

* From Table C. — Wages and Hours of Labor in the Bool and Shoe Industry: IQ07 to iqi8. U. S. Bureau of Labor Statistics.

CHAPTER XI

THE MAKING DEPARTMENT

Its Nature. This department is called also the bottoming department and the " gang " room, the last name arising from

the earlier custom of work in this department under the gang system. Here the uppers of shoes, prepared in the cutting room and stitching room, and the soles, fitted in the sole leather room, are brought together, lasted and made into shoes ready for finishing. This department falls into natural divisions as follows:

i. The Lasting Department.

2. The Welt Bottoming Department.

3. The McKay Bottoming Department.

4. The Heeling Department.

5. The Turn Shoe Department.

6. The Standard Screw, Nailed, or Pegged De-

partment.

These divisions are not clearly drawn and through them all runs the large general method of bottoming, modified only by the variations necessary for attaching uppers to the bottoms of certain styles and kinds of shoes, as has been already explained at length in Chapter VIII upon " Methods in Shoe Manu-

facture." There are many processes in the making room, about fifty, for instance, following through any one method, and many more made necessary by the multiplication of methods.

This chapter is illustrated much more fully than others in this volume because of the many important and heavy processes found in the bottoming room,

Bed Lasting Machine No. 5

and because of the wonderful machines invented for their performance. Here the inventor of shoe machinery is at his best.

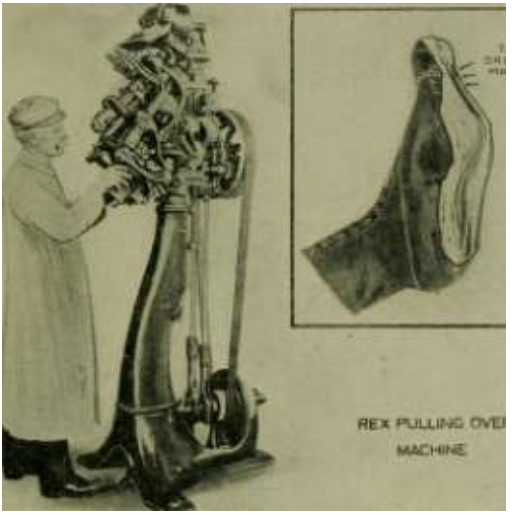
The Lasting Department. There are two methods of lasting, by hand and by machinery. The first, like most other processes in shoemaking, is giving way rapidly to the machine method.

Adjusting the upper of the shoe to the last is the beginning of the work done in the bottoming department. The toe box is put in its proper place between the lining and the upper ; and the counter in its place at the heel, between the lining and the upper. Then the upper is drawn over the last upon which has already been tacked the insole, which conforms exactly to the shape of the last, and is tacked to hold it in place.

The Pulling Over Machine. As the parts of the shoe have been cut to conform to the shape of the last they must be accurately attached upon it. The pulling over machine has pincers which act exactly like the human fingers. These pincers grasp the leather at various points around the toe and draw it closely against the wood of the last upon the inner sole. By an adjustment of levers all parts of the upper are drawn in evenly and tacked securely in place.

Toe and Heel Wiping. The toe and heel are the most difficult parts to last properly. These are drawn in by a series of wipers upon the lasting machine, so evenly that no wrinkles are left, and held in place by a strip of tape, fine wire, or by tacks. Tacks except at the heel, where they are clinched on the inside, are driven only part way in so that they may later be withdrawn to leave the inside of the shoe perfectly smooth, the distinctive feature of the welt method.

The Upper Trimming Machine. The surplus upper leather drawn over the bottom at the toe and heel and sometimes at the sides of the shoe ; is removed upon the upper trimming machine in which a knife cuts the extra parts away very smoothly and evenly,



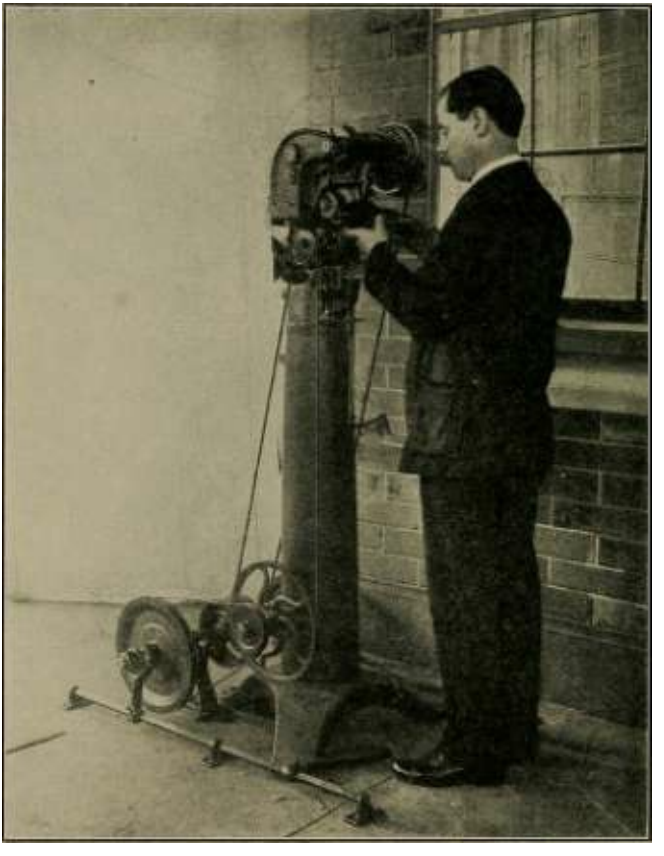
REX PULLING OVER MACHINE

Rex Pulling Over Machine

while at the same time a small hammer pounds the leather smooth along the sides and toe of the shoe. The shoe then passes to another machine by which the leather and counter around the heel are beaten into conformity with the last, making the entire bottom ready for the welt bottoming processes.

THE SHOE INDUSTRY

Positions in the Lasting Department. The chief positions in this department are, the Superintendent,



Operating the Goodyear Universal Inseam Trimming Machine

foreman, operators of the pulling over machine, the lasting machine, and the trimming and pounding machines.

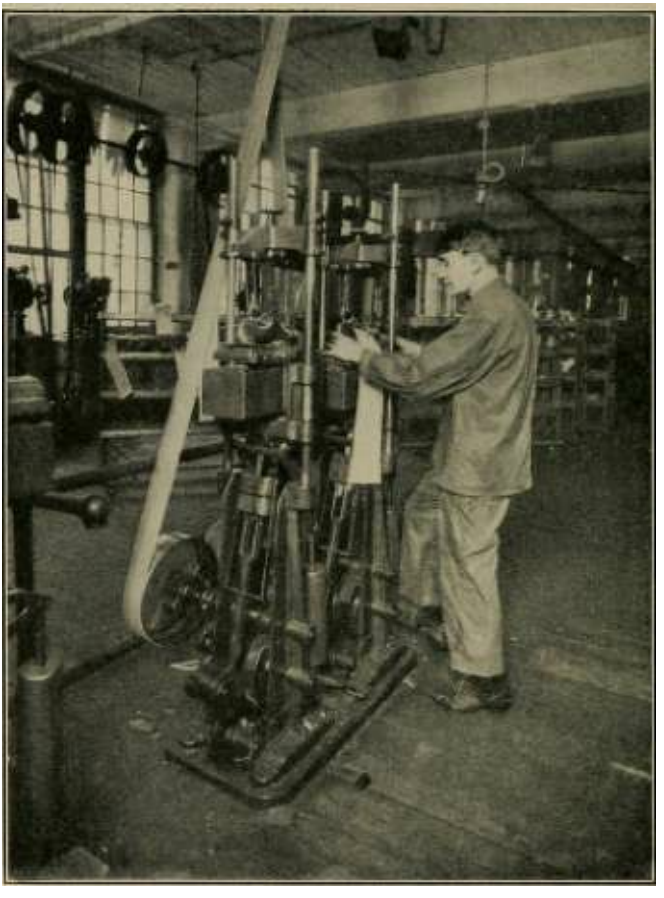
The Welt Bottoming Department. The welt method of bottoming is coming increasingly into use because of producing a smooth inside bottom of the shoe, and because

of the ease with which a welt shoe can be repaired after being worn. After the lasting operations the shoe is ready to receive the outsole.

Welting. First the welt which is distinctive of this method of shoemaking is attached. The welt is a narrow strip of leather so prepared that it may be sewed first to the lip of the inner sole and to the upper leather and later to the outer sole, no stitching passing entirely through the bottom of the shoe as in the McKay method. The welt extends in front of the heel entirely around the shoe. This process was a very difficult one in the days of hand shoe-making, but as performed upon a machine it becomes simple and rapid. It is claimed, indeed, that this particular machine process has been the leading factor in the great development of shoe manufacturing in recent times. After this process the surplus parts of the lip, upper, and welt are trimmed off by the inseam trimming machine.

Welt Beating. The next process is welt beating upon a machine in which a small hammer with rapid strokes beats the welt down evenly at the side of the shoe. The insole and the welt are now coated over with rubber cement. At the same time the outsole receives a coating of cement.

Sole Laying. When this has dried slightly the process of sole laying takes place. The sole is put



Operating the Goodyear Improved Twin Sole Laying Machine

in place and pressed firmly upon the shoe and welt in the sole laying machine, remaining in the machine

THE MAKING DEPARTMENT

a sufficient length of time for the cement to set firmly. Rough Rounding. Next comes the trimming of the sole and welt so that they will extend a uniform distance from the upper leather. This process is called rough rounding and is one of the most im-

rait

GOODYEAR WELT AND TURN SHOE MACHINE, MODELK

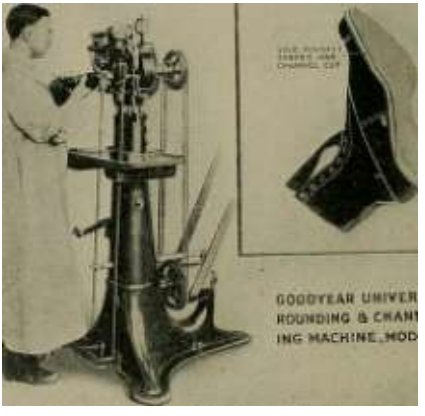
Goodyear Welt and Turn Shoe Machine, Model K

portant, exacting, and arduous processes found in the entire factory. A machine gauges the distance at which the cutting

shall be done from the last, cutting usually wider on the outside of the shoe than on the inside and reducing the width of the shank. In any lot of shoes, large or small, passing

through the hands of the rough rounder there must be the same variation of margin according to size and design.

The rough rounding machine cuts also a little slit or channel along the edge in the bottom of the sole. This channel was formerly cut by hand. Its



GOODYEAR UNIVERSAL ROUNDING & CHANNEL-ING MACHINE,MODEL E

Goodyear Universal Rounding and Channeling Machine, Model E

purpose is to allow a covering for the stitching that follows.

Heel Seat Nailing. The process of rough rounding deals simply with that part of the shoe in front of the heel to which the welt has been sewed. The heel portion of the outsole is next fastened by nailing

securely through to the inner sole. The surplus leather around the heel is now trimmed off on the

Operating the Goodyear Heel Seat Rounding Machine

heel seat rounding machine, which cuts a channel also. This channel is opened evenly to provide for stitching.

Sole Sewing. The outsole is now stitched to the welt entirely around the shoe upon the outsole lockstitch machine, a process very similar to welt sewing. This stitching, however, is finer and very durable. It shows on the upper side of the welt around the finished shoe.

Channel Laying. The lip of the channel is now cemented upon a machine, partly dried, and is rolled smoothly and evenly back into place upon the channel laying machine, completely covering the stitches which would otherwise show on the bottom of the shoe.

Leveling. The shoe is passed beneath a vibrating roller under heavy pressure in the automatic sole leveling machine. The roller passes completely up and down each side of the shoe, canting first to the right and then to the left and removing every un-evenness on the bottom.

Welt Finishing. The edge of the fore part of the shoe was left in a slightly rough condition after the process of rough rounding. This roughness is now smoothed away upon the trimming machine, which has a set of rapidly revolving cutters. The edge and welt of the shoe receive a coat of blacking, and the stitches showing on the upper side of the welt are separated on a machine so as to present an even appearance. The indentations thus made are burnished upon a machine. The edge of the shoe

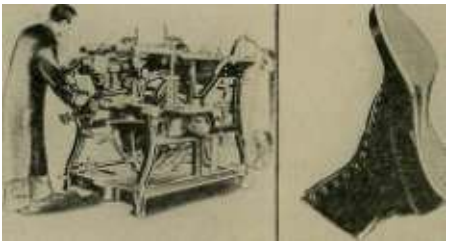
is burnished upon the edge setting machine by means of two rapidly vibrating hot irons. The surface of the top lift of the heel is leveled upon the top lift sanding machine, and the breast is scoured on a rapidly revolving disk.

Goodyear Outsole Rapid Lockstitch Machine

Other Finishing Processes. From this point on there are various processes of finishing the heel and the bottom of the

shoe, which may be performed in the bottoming department or in a separate finishing department. Some of these, such as tip repairing, are quite separate from the work of the bottoming department. The more important of the finishing processes may be presented here.

The heel and the edges of the shoe are blacked or covered with the dressing suitable to the leather used on shoes other than black, and finished on burnishing machines. The bottom of the shoe is buffed upon revolving rollers covered with sand-



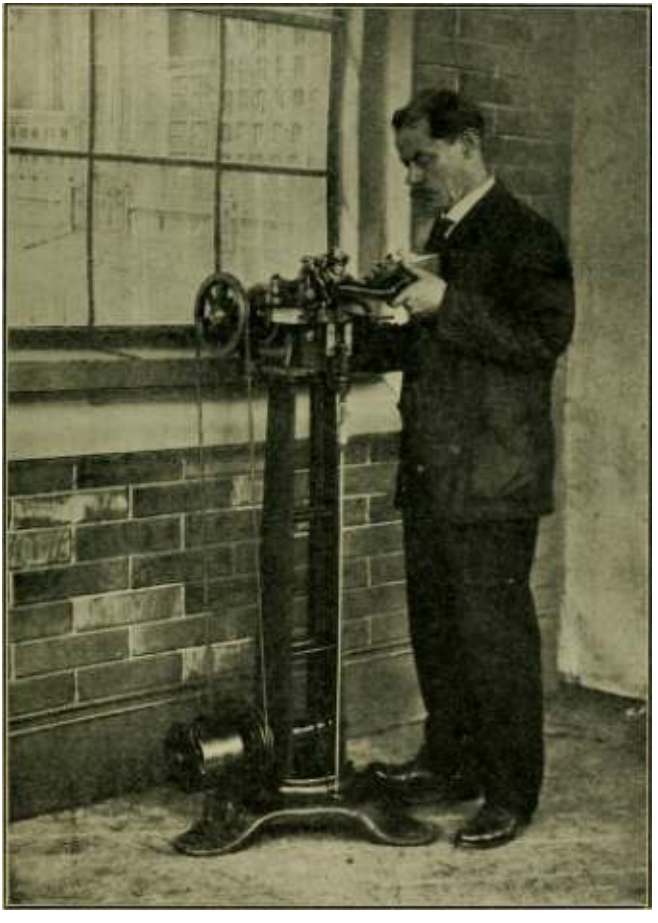
6O00YEAR AUTOMATIC SOLE LEVEUNS MACHINE

Goodyear Automatic Sole. Leveling Machine

paper, to remove the marks of handling in various processes. It is then buffed to a finer degree on the Naumkeag buffing machine upon a pad of rubber covered with fine emery paper, revolving still more rapidly than the first buffing machine. The bottom of the shoe is now " hard finished " by

receiving coats of stain or other material, and by polishing. In some cases the bottoms are blacked in whole or in

part, and some receive a dull finish on the forepart, while the whole is thoroughly polished upon revolving brushes.



Operating the Hadaway Stitch Separating Machine

THE SHOE INDUSTRY

Positions in the Welt Bottoming Department. The more usual positions in the welt bottoming department are as follows:

The McKay Bottoming Department. The McKay bottoming

department is that division in which the upper is attached to the sole by a machine which sews directly through the outsole, upper leather, and insole. The upper parts come to the McKay room from the lasting room; the outer soles come from the sole leather department, having been kept in humidifiers so as to be moist and ready for use.

THE MAKING DEPARTMENT

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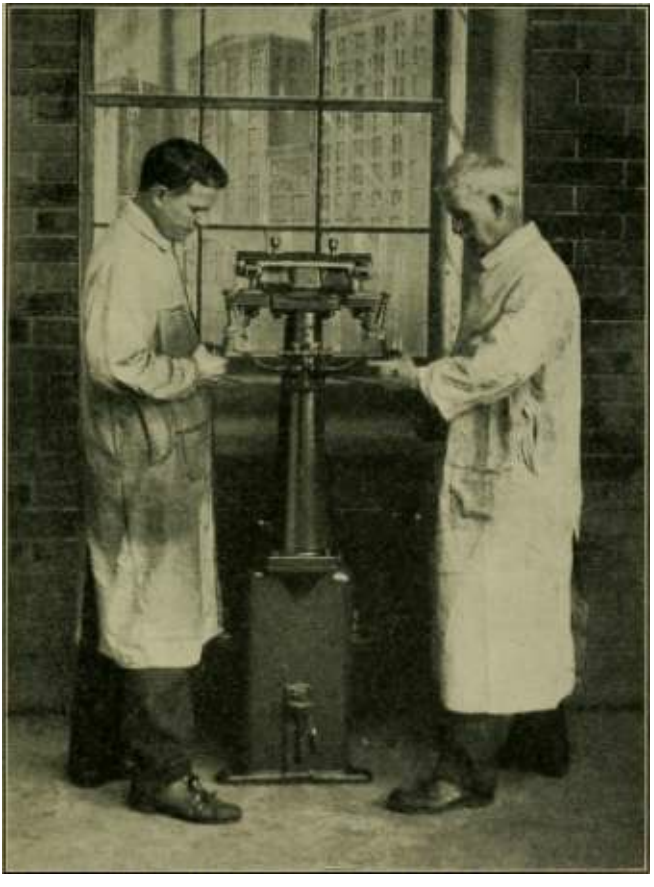
Processes Connected with the McKay Method. First the toes of the uppers, already upon the lasts,



Operating the Twin Edge Setting Machine

are buffed upon an emery wheel which grinds off the surplus leather and nails, so that the outer sole will

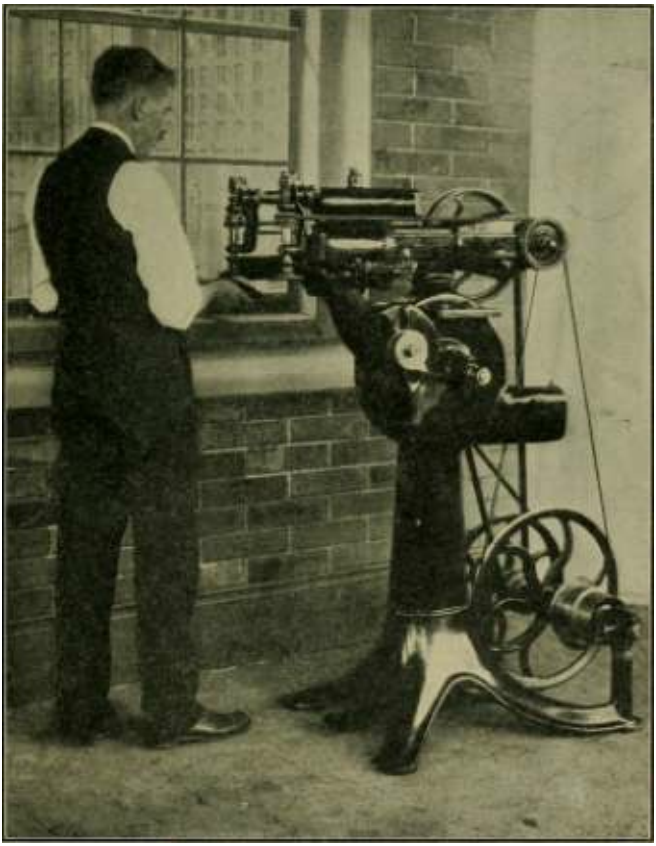
lie even upon the shoe. The outer sole is then " layed " in

place and nailed or tacked in the toe,

Operating the Top Piece Sanding Machine

shank, and heel upon a machine. The lasts are now pulled or withdrawn from the shoe by hand, and

the McKay stitching process is performed upon the McKay machine. This is a very particular and

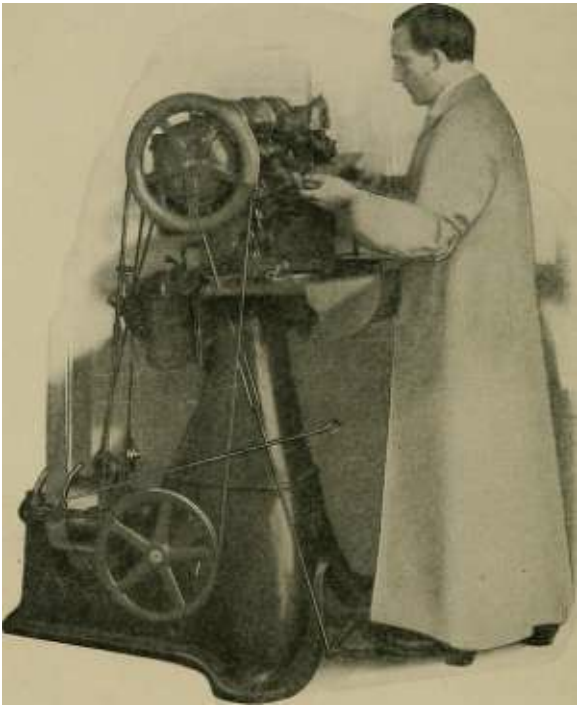


Operating the Naumkeag Buffing Machine

exacting process and is found in most shoe factories at the present time. For comparison between this

and other methods the reader is referred again to Chapter VII.

The usual processes following the McKay stitching are, heel seat nailing on a machine, channel



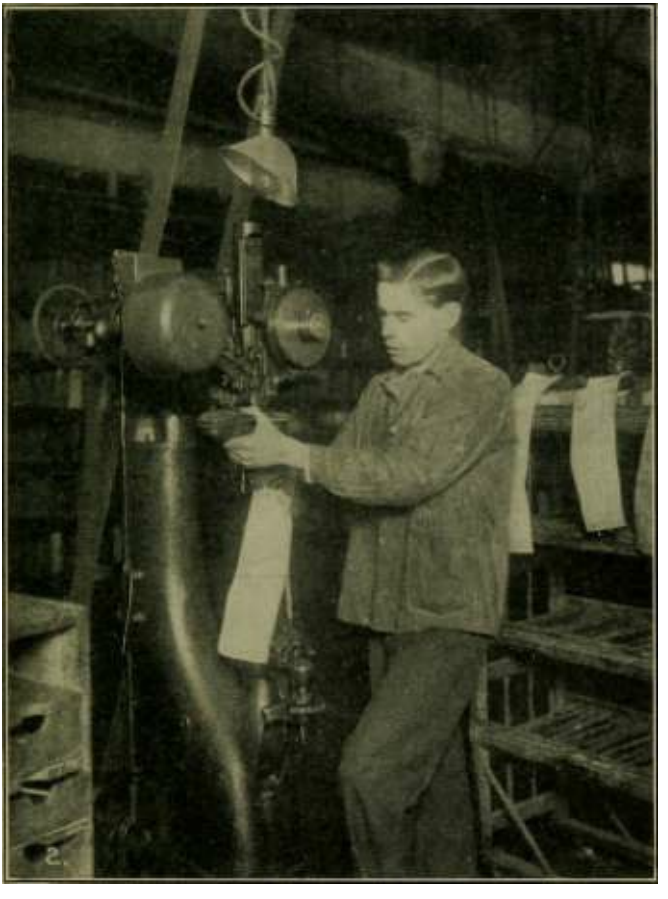
Operating the Goodyear Stitching Machine

lifting or opening and cementing, wetting the bottom of the shoe upon a brush revolving in water, channel laying upon a

steel roller which by a corrugated lip draws the channel in smooth, beating out the bottom in a machine and by hand to make

it smooth and give it proper lines, drying, and heel attaching.

Before relasting McKays and sending them on



Nailing Heel Seat

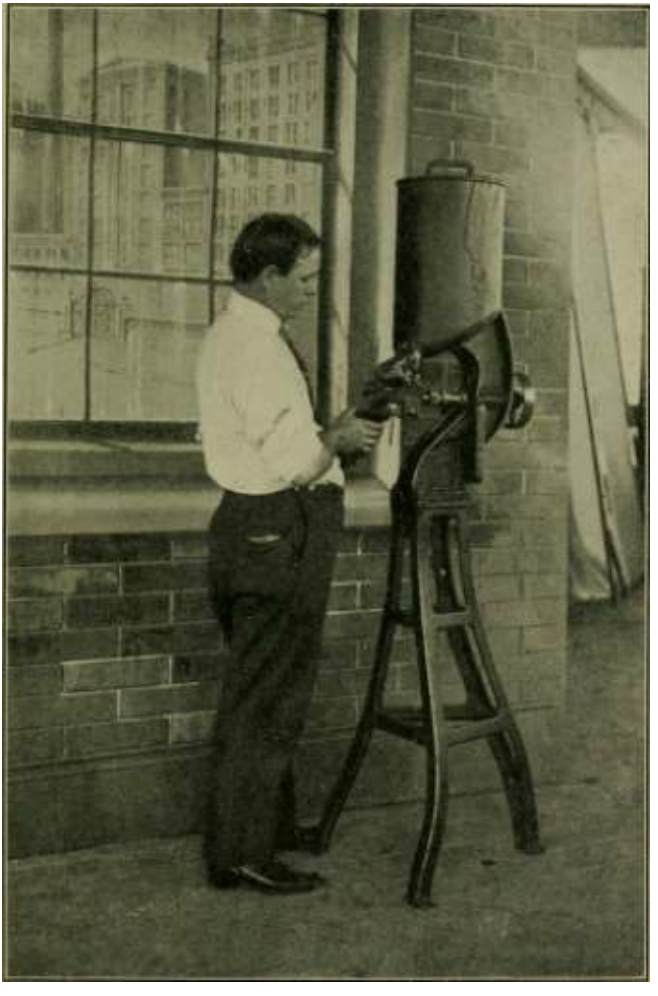
to finishing, the bottom lining must be inserted, a work generally done by girls. Linings of thin leather or leather substitute, which were dinked out in the upper cutting department, are selected by sizes. The inside of the bottom of the shoe is cemented by a brush, and the linings are inserted by hand and smoothed down by means of a stick. Wooden

lasts or " followers " are now inserted upon a machine.

Positions in the McKay Bottoming Department. The positions in this department are generally as follows:

i. The Superintendent. 9. Cementers.

The Heeling Department. The heel is now attached to the shoe upon the heeling machine. The shoe is placed upon a jack in the machine and an arm bearing the nails is swung automatically over the heel, driving the nails through the heel, outsole, upper leather, and insole, where they are clinched upon the inside.



. Operating the Channel Cementing Machine

Blind Nailing. The heads are left extending far enough outside the heel to receive the top lift. This is made from the best of leather, and is subjected to great pressure to harden it. Previously prepared, and with a coating of glue, it is now

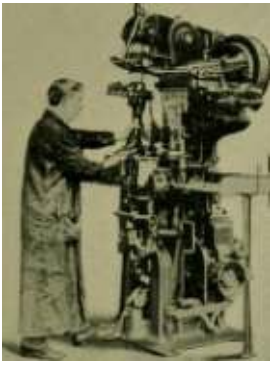
placed

The Heeling Room of the Making Department

in position, with the shoe still in the machine, and driven down over the protruding nails. This is the process of " blind nailing."

Slugging. Short nails, or " slugs," of brass or other metal are now driven into the top lift by the slugging machine, to increase the wearing qualities of the heel.

Heel Trimming. The top lift is made in the exact size of the finished heel, and is a guide for the operator of the trimming machine, which by means of a rapidly revolving knife cuts away all the surplus leather on the outside. The breast or front

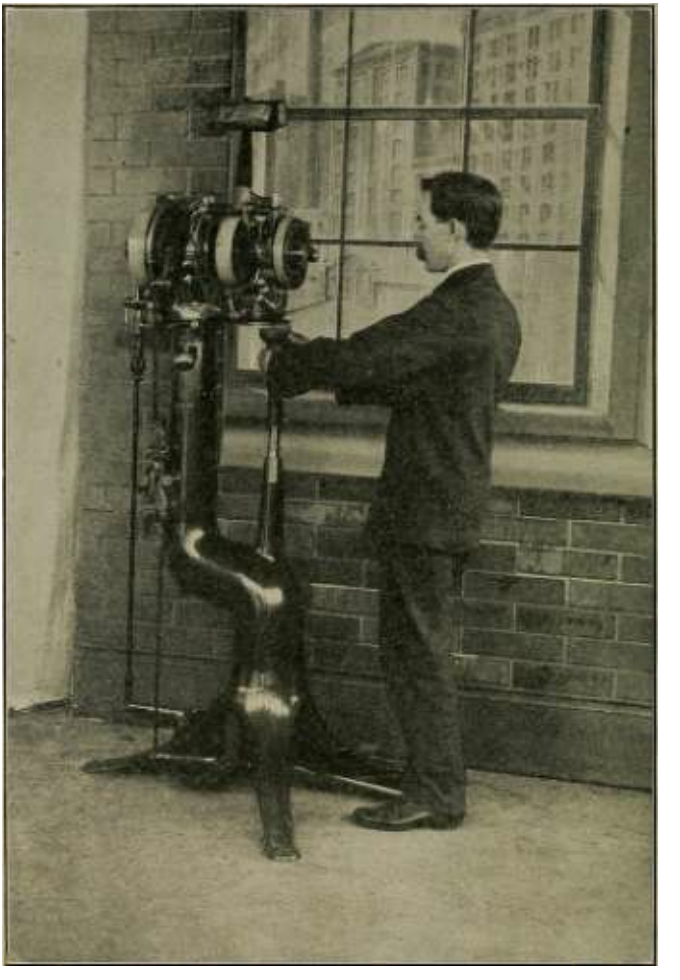


McKAY AUTOMATIC HEEL LOADING AND ATTACHING MACHINE

McKay Automatic Heel Loading and Attaching Machine

is trimmed evenly across on the " heel-breasting " machine. The outside of the heel is scoured or smoothed by rolls covered with sandpaper, on the heel scouring machine.

Heel trimming, like the rough rounding of the sole, is an exacting process, calling for strength and



Operating the Universal Slugging Machine

skill. It sometimes produces in the operator what is called " broken wrist/' or a weak wrist, as the shoe, held firmly in both hands against the knife of the machine, must be turned nearly through an entire circle, both turning and twisting the

wrist joints. When the effect upon the operator becomes marked he usually changes to some other process.

Positions in the Heeling Department. The chief positions in this small department are, the superintendent, the foreman, and the operators of the nailing, slugging, and trimming machines.

The Turned Shoe Department. The turned shoe or slipper is made with an ordinary upper, usually of light weight, and with a single sole of flexible quality. Soles are prepared or fitted in this department one day in advance of their use. The main processes in the preparation of the soles are the following:

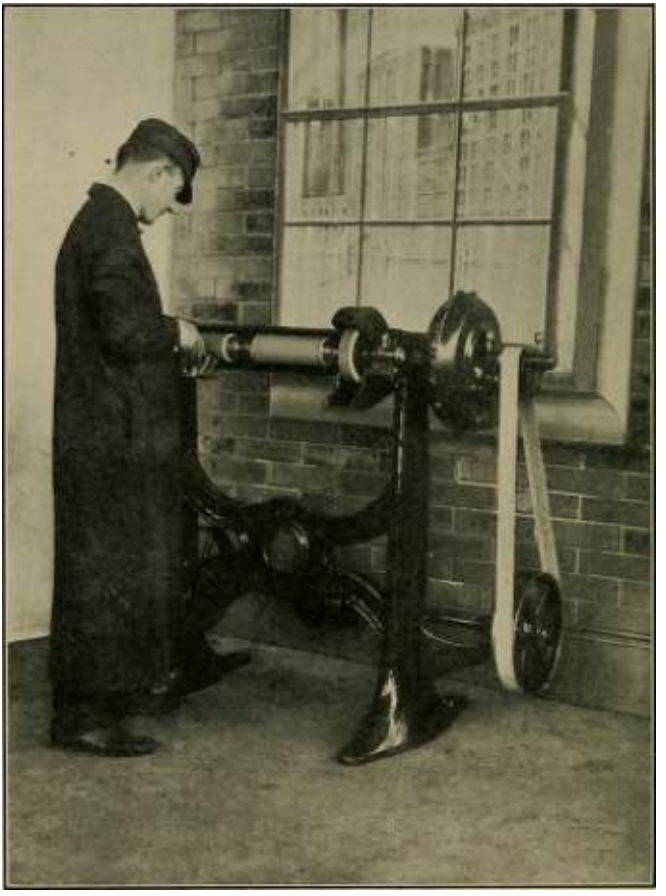
The soles are channeled and placed in humidifiers over night. In the morning the shank is trimmed out, the heel scarfed or trimmed off, and the sole is molded into shape.

Lasting the Turned Shoe. In lasting the sole is placed upon the last upside down, and the upper is drawn over the last, inside out. The counter is put in wrongside out. All parts are tacked carefully in place.

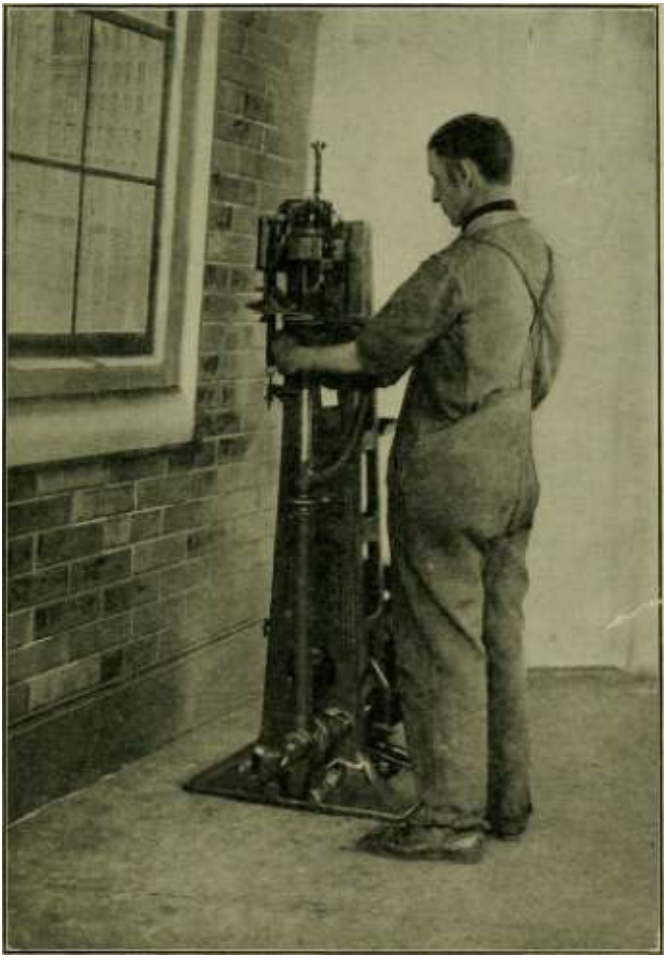
The sewing of the upper to the sole now takes

place upon a special turn shoe machine. Tacks are withdrawn and the selvage trimmed off, and a small steel

shank is sewed in the space between the heel



Operating the Ultima Heel Trimming Machine



Operating the Imperial Heel Breasting Machine

and the ball of the front. The last is then withdrawn and the shoe is turned by hand over the toe upon an iron support. The last is then put back in the shoe and the lining smoothed out around the heel part, which is then leveled and prepared for

the heel which is to be added, either of leather, leather substitute, or of wood. This is glued, clamped on firmly and left to dry, and finished later. Usually three nails are inserted to hold it permanently. A lining or heel piece is inserted for smoothness.

Positions in the Turned Shoe Department. The usual positions in this department are as follows:

shoes to keep them clean while passing through the various processes of the department. 16. Floor Boys.

THE MAKING DEPARTMENT

225

The Standard Screw, Pegged, and Nailed Departments. Various kinds of heavy working shoes are manufactured by the standard screw method, by

Operating the Expedite Heel Finishing Machine

pegging, or by nailing the outsole and insole together, thus fastening the bottom of the shoe to the upper. By the first method a wire with screw thread upon it is driven through the bottom and automatically cut off by the machine, piece after piece, rapidly around the bottom. This is practically a wire sewing in place of McKay stitching. The pegged shoe is made in about the same manner, a machine inserting wooden

pegs instead of the sections of wire. The use of pegs was once very general, but is now gradually giving way to other methods. Nails when used are generally clinched on the inside. These three methods give strong and firm but inflexible and heavy bottoms to the footwear.

The other processes connected with these special kinds of footwear are similar to the general processes of welt and McKay manufacture. Finishing does not, however, call for so high a degree of perfection.

Aside from the operators of the special machines used for inserting the wire screws, pegs, and nails, the positions in general are the same as in the welt and McKay departments.

Work in the Making Department. In the early days of American shoe factories the bottoming of shoes was quite generally let out to men on contract, as has been indicated earlier in this volume. Such contract work was performed by gangs of men who

went from factory to factory. And we find the gang system in use to a degree in factories at the present time. It is easier, for instance, for several men to work together upon a process or group of processes involving operations that must be done together in a very brief space of time, working at one bench or upon a complicated machine.

This department involves the heaviest and most exacting

processes of shoe manufacture, and the major processes are regularly performed by men, who in the main must be strong and active. Boys, girls, and women assist in the minor processes and in the handling of materials.

In the bottoming or making room the machines are always ranged along the sides of the room, next to the windows, so that there may be good light for the many intricate operations necessary. Shoes in process of making are arranged upon racks along the inner spaces of the room.

THE SHOE INDUSTRY

Table XVII* Average and Classified Full-Time Hours per Week and Rates of Wages per Hour, and Average Full-Time Weekly Earnings, in the United States, by Years, 1907 to 1918.

Lasting Department

* From Table A. ■— Wages and Hours of Labor in the Bool and Shoe Industry: iqo? lo iqi8. U. S. Bureau of Labor Statistics.

THE MAKING DEPARTMENT

TABLE XVII — Continued

Lasting Department

THE SHOE INDUSTRY

TABLE XVII — Continued

Lasting Department

37 establishments... .

57 establishments....

Bed-machine operators, male: IS establishments... .

35 establishments.... 54 establishments... . 65 establishments....

60 establishments

64 establishments.... 89 establishments... .

104 establishments ..

Hand-method lasting-machine operators, male: 6 establishments... .

33 establishments.... 39 establishments....

1916 1918

1918

rgog 1910

1910 1911

1911 1912

1912 1913

1913 1914

1914 1916

1916 1918

1918

1907

1909 1910

1910 1911

1911 1912

230 234

246 3°o 307 300

5X3 568

793 1,004

1,127 1,220

i,H3 1,092

1,294 1,179

325 352

477 478

55-o 52.0

54-7 54-8 54-8 55-o

56-4 56.1

56.1 55-5

55-6 55-2

55-i 54-9

5S-o 55-1

5S-o 52.1

•332 .462

.468

•35° •334 •342 .321

•311 .323

.321 •304

.300 ■330

•331 .322

.319 •351

•347 •501

-311 •307 •309 .322

.306 .309

.316

■324

18.22 23-95

19-15 18.30 18.74 17.66

I7-50 18.09

17.96 16.88

16.67 18.21

18.21 17.68

17-52 19-31

19.04 26.06

25.98

17.76 17-38 17-52 18.06

17.49 17-65

17.96 18.03

606

34 36

77

159

201 151

216 354

343

432

401

39°

120 41

106 101

134 85

THE MAKING DEPARTMENT

TABLE XVII — Concluded

231

Lasting Department

41 establishments... . 35 establishments.... 32 establishments.... 40 establishments....

5g establishments....

Turn lasters, hand, male:

28 establishments..

26 establishments..

29 establishments..

35 establishments..

Turn sewers, machine, male: 17 establishments....

23 establishments

25 establishments...

24

THE SHOE INDUSTRY

Table XVIII.* Average and Classified Full-Time Hours per Week and Rates of Wages per Hour, and Average Full-Time Weekly Earnings, by States, 1918.

Occupation, sex, and State

Number of establishments

Number of employees

Average

full-time

hours per

week

Average

rate of

wages per

hour

Average full-time weekly earnings

Lasting Department

* From Table C. — Wages and Hours of Labor in the Boot and Shoe Industry: iqoi to iqi8. U. S. Bureau of Labor Statistics.

THE MAKING DEPARTMENT

TABLE XVIII. — Continued

233

Occupation, sex, and State

Number of establishments

Number of employees

Average

full-time

hours per

week

Average

rate of

wages per

hour

Average full-time weekly earnings

Lasting Department

THE SHOE INDUSTRY

TABLE XVIII. — Concluded

Occupation, sex, and State

Number

of establishments

Number

of employees

Average full-time

hours per week

Average

rate of

wages

per hour

Average full-time weekly earnings

Lasting Department

THE MAKING DEPARTMENT

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Table XIX. * Average and Classified Full-Time Hours per Week and Rates of Wages per Hour, and Average Full-Time Weekly Earnings, in the United States, by Years, 19P7 to 1918.

* From Table A. -1907 to 1918. U. S.

- Wages and Hours of Labor in the Boot ond Shoe Industry: Bureau of Labor Statistics.

TABLE XIX. — Continued

THE MAKING DEPARTMENT

TABLE XIX. —Continued

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THE SHOE INDUSTRY

TABLE XIX. — Continued

THE MAKING DEPARTMENT

TABLE XIX. — Continued

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Bottoming Department

THE SHOE INDUSTRY

TABLE XIX- — Concluded

Bottoming Department

THE MAKING DEPARTMENT

.241

Table XX.* Average and Classified Full-Time Hours per

Week and Rates of Wages per Hour, and Average Full-Time Weekly Earnings, by States, igi8.

Occupation, sex, and State

Number of establishments

Number of employees

Average

full-time

hours per

week

Avera ge rate of wages

per hour

Average full-time

weekly earnings

Bottoming Department

* From Table C. — Wages and Hours of Labor in the Bool and Shoe Industry: IQ07 to igiS.. U. S. Bureau of Labor Statistics.

THE SHOE INDUSTRY

TABLE XX. — Continued

Occupation, sex, and State

Number of establishments

Number of employees

Average full-time

hours per week

Average

rate of

wages

per hour

Average full-time weekly earnings

Bottoming Department

THE MAKING DEPARTMENT

TABLE XX. — Continued

Occupation, sex, and State

Number of establishments

Number of employees

Average full-time

hours per week

Average rate of wages

per hour

Average full-time weekly earnings

Bottoming Department

THE SHOE INDUSTRY

TABLE XX. — Concluded

Occupation, sex and State

Number of establishments

Number of employees

Average full-time

hours per week

Average rate of wages

per hour

Average full-time

weekly earnings

Bottoming Department

CHAPTER XII

FINISHING, TREEING, PACKING AND SHIPPING

Additional Departments. In a large shoe factory the magnitude of manufacture calls for separate departments of considerable size for the finishing and treeing of the shoe, and for the packing and shipping

Buffing Machines Placed Longitudinally with Building

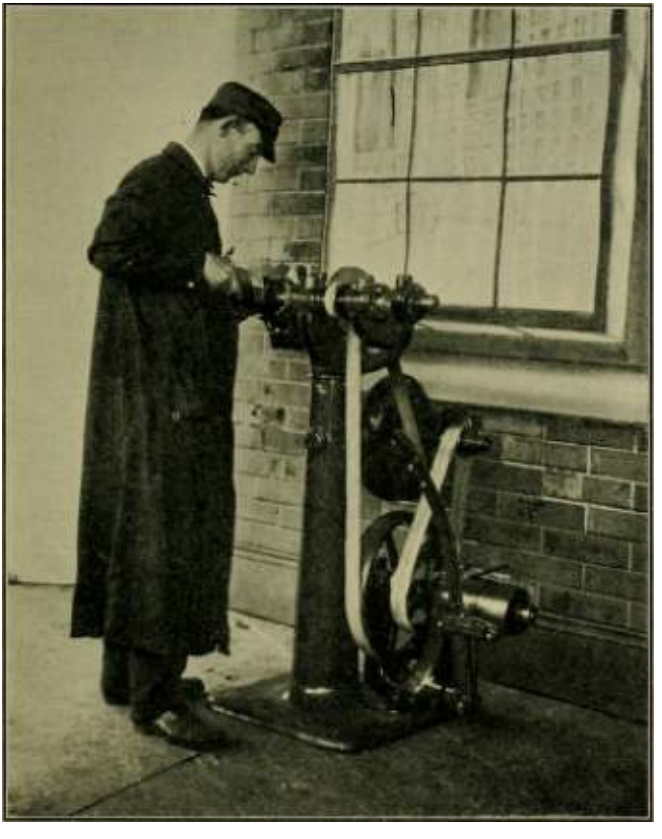
of the completed product. There will be found in especially large establishments, also, various other departments, or even small factories, manufacturing

particular supplies or doing particular work. Such are departments or factories for the manufacture of leather parts of shoes, for the preparation of accessory materials, and for the provision for work that would otherwise have to be given to outside companies or individuals. We have already spoken of the heel, toe box, and counter departments and factories. The second division is seen in cases where the great shoe manufacturing corporation conducts its own sawmill and factories for the making of wood shipping cases and paper cartons in which shoes are sent out to the trade. An example of the third division is the printing department or shop now being added to many factories because of the great cost of printing the many business forms necessary for office and factory use, and because of the continual increase in the output of advertising material.

All such factories, departments, and shops provide numerous opportunities for employment according to the trades involved, but with little interchange of labor between them and the shoe factories except where the manufacture of shoe parts is involved. Then, of course, it is a matter of employment in a subdivision of the shoe industry.

Finishing. It has already been said that in a large shoe manufacturing establishment the finishing processes detailed in the preceding chapter would

constitute a separate department. In a small factory, however, the only part of the finishing that

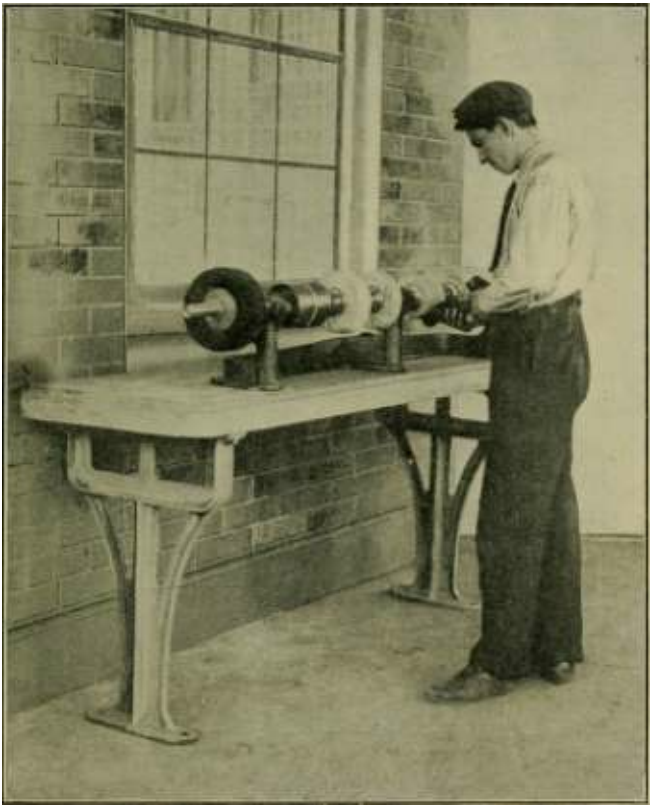


Operating the Buffing Machine

would be distinctly separate from other operations is tip repairing.

The Tip Repairing Department. In the passage of the shoe through the factory we have seen the vamp, the linings, the toe box, and the tip brought together in the completed toe of the shoe. Sometimes, also, oiled paper is added as a protection against injury in the handling of the shoe. All of these parts give a thickness of about one-half inch to the toe of the ordinary shoe. In lasting so many thicknesses it is especially hard to draw the tip evenly over the last without injuring the leather of the tip. This danger is considerably increased by the use of patent leather, which is easily broken or scarred, for tips. The use of patent leather is so general that tip repairing is a problem of considerable magnitude in all factories. In the general handling to which a shoe is subjected in passing through the various departments of the factory, tips are likely to be scratched and broken. In the case of ordinary leather scratches, scars, or other marks can be quite easily disposed of by rubbing down, by hand or upon machine brushes But patent leather, having a varnished surface, is repaired with greater difficulty. If the injury is considerable the old enamel or varnished surface is sandpapered entirely off, and a new coat of varnish is applied by hand. This is allowed to dry and is polished, giving usually an entirely fresh and perfect surface. This work is mainly a hand process,

usually done by women, though recently a tip repairing machine has been introduced in some factories.



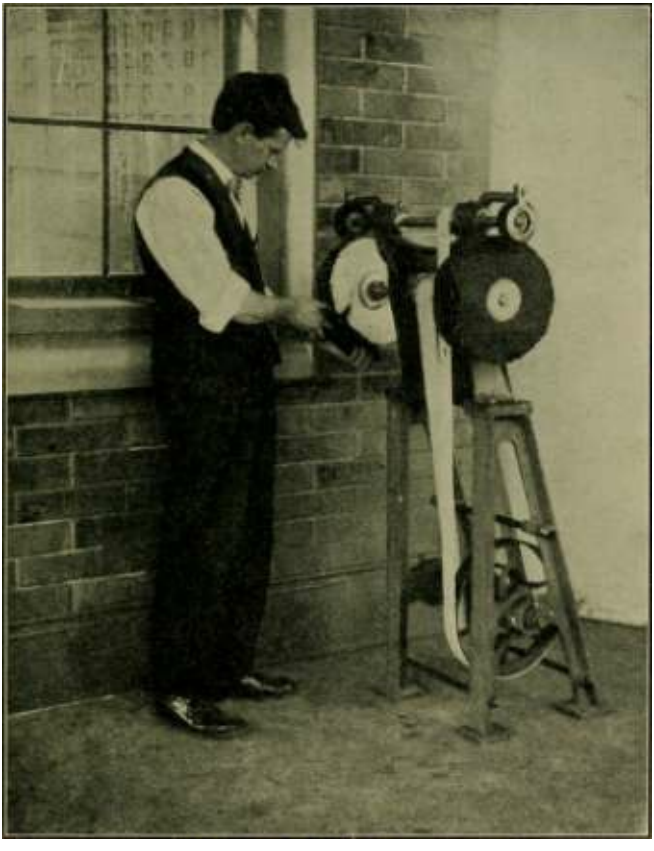
Climax Finishing Shaft

Tip repairing calls for careful observation, painstaking application to a process often requiring con-

siderable time upon a single shoe, deftness of touch, and good judgment.

The Treeing Department. Treeing is the method of making the shoe conform perfectly to the shape of the last, and of restoring the finish belonging to the leather, after its passing through many hands. The last is removed in this department, or before reaching this department, to allow for the processes of treeing. The shoe is first examined for tacks or other imperfections inside. Bottom linings or heel pads are put in by girls, when this has not been done in the making room. The shoe is then placed upon the tree arm, there being several arms revolving upon a machine, so that one shoe may be worked upon while others are drying. The department is sometimes called the treeing and dressing room. Nearly every kind of leather or shoe material requires a distinct method of handling and of dressing or finishing. Dirt or other materials that have adhered to the surface of the shoe in making are removed by a brush which is adapted to the surface of the leather, or by washing with different cleaners. Then an oil lubricant or dressing is applied to fill the pores of the leather. The covers of fabric shoes and of shoes made of delicate shades of leather are removed by hand, cutting with a knife closely around the sole so that no trace of the cover remains and no injury results to the shoe. The operator

may have to restain some leathers as well as to fill the pores with oil, so as to bring out the richest



Stitch and Upper Cleaning Machine

effects of the surface. There are many special processes in various factories, according to particular styles of shoe and kinds of finish used.

Ironing. When the surface of the upper has been fully restored the shoe is ironed upon the tree to give it perfection and permanent form. Rubbing over with the warm or hot iron

is a very important and careful process, and is done regularly by men.

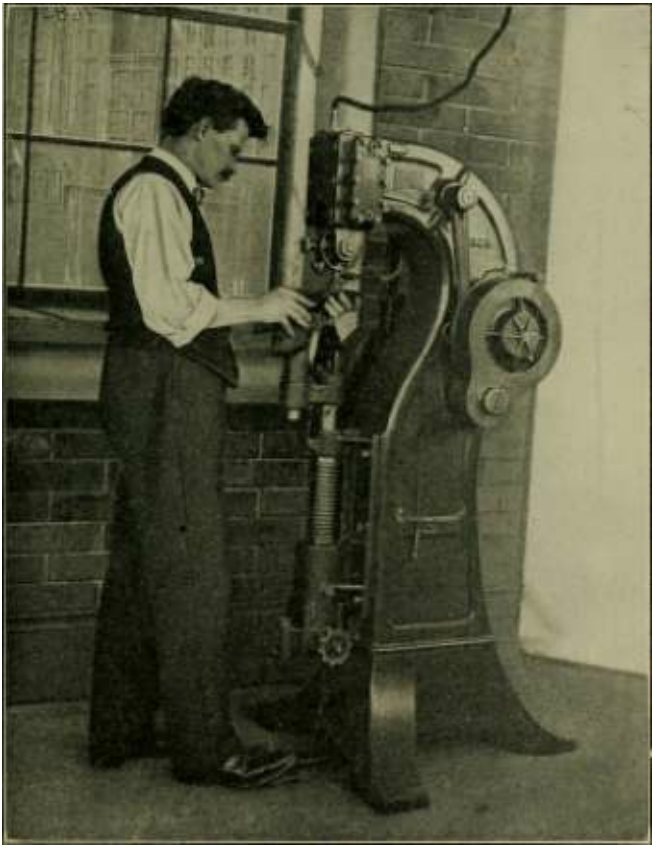
Inspecting. Slight repairs not made before the processes of treeing are made after it ; and the shoe is inspected before passing out of the department. Shoes intended for samples or display in store windows have a wooden form placed in them ; rather than a last, to keep them in shape.

The " treeing man " should be familiar with the nature and tanning of leather, and with the processes of shoe making, so that he may correct defects in leather or poor workmanship in the earlier processes of the factory.

Embossing. Then on the bottom of the shoe or upon the lining at the top a trade-mark or the name of the maker of the shoe is embossed or stamped.

Positions in the~ Treeing Department. The positions uusually found in treeing and dressing are the following:

The Packing Department. The great advance in shoe manufacture during the last half century is



Operating the Stamping Machine

seen not only by studying machinery and processes, but by observing the excellent condition in which

boots and shoes are sent out to the trade. Before the use of special cartons, which is distinctive of the present day, shoes were tied in bundles or packed loose in barrels and boxes, often reaching the customers in wrinkled and battered

condition. Now a single pair, except in the case of heavy and cheap grades, is packed in a pasteboard box or carton.

For packing, shoes are first brushed upon the heels and bottoms, inspected, and placed out on tables in pairs by sizes. The labels on the ends of the cartons are stamped in a machine with style, stock number, size, width, kind of leather, or other distinguishing term. Then the shoes are wrapped in tissue paper and placed carefully in cartons, which are packed securely in wooden or fibre-board cases, usually with thirty-six pairs to a case, ready for shipment.

Positions in the Packing Room. The work of this room is done mainly by girls and women, and the few positions are, the Superintendent, foreman, brushers, inspectors, carton stampers, packers, and floor girl.

The Shipping Department. From the packing room the shoes are sent to the shipping department where they are placed in " assembling aisles " in alphabetical arrangement, according to the names of customers, orders and styles. Copies of original orders as received by salesmen are kept in the ship-

ping department, and shoes are checked off upon one set as they come from the packing room, another set of orders being used for shipping. The cases of shoes are sent out to the freight offices accompanied

Shipping Floor, Central Plant, W. H. McElwain Company, Manchester, N. H.

by bills of lading as the time for filling each order approaches, and shipment is made so that the goods will reach each customer on a specified day.

Foreign shipments require a great amount of detail, since they must have a different form for bills of lading and different weights and measures.

Large shipments go out by freight, small ones by express, and by parcel post.

After the bills of lading which are to go with shipments are made out, special tags bearing full particulars about each shipment are sent to the bookkeeping department so that the proper charges may be entered in that department.

Positions in the Shipping Department. The positions of the shipping department are as follows.

i. The Superintendent.

2. Foreman.

3. Checkers.

4. Assemblers.

5. Men for casing up, sealing, nailing, and stack-

ing goods.

6. Truck Boys.

7. Shippers.

8. Clerks and Assistants.

FINISHING, TREEING, AND SHIPPING 257

Table XXI. * Average and Classified Full-Time Hours per Week and Rate of Wages per Hour, and Average Full-Time Weekly Earnings, in the United States, by Years, 1907 to 1918.

Finishing Department

Treers or ironers, hand, male: 17 establishments..

44 establishments. 63 establishments. 73 establishments. 70 establishments. 67 establishments. 97 establishments.

US establishments. Treers or ironers, hand, female: 8 establishments..

11 establishments.. 13 establishments..

12 establishments.. 11 establishments..

1909 1910

1910 1911

1911 1912

1912 1913

1913 1914

1914 1916

1916 1918

1918

1910 1911

1911 1912

1912 1913

1913 1914

1914 1916

381 364 377 444

832 786

1,006 1,076

1,143 1,110

1,100 1,109

1,095 1,038

1,220 1,044

no 112

107 II I

54-7 54-5 S4-6 54-5

55-9 56.1

56.0 55-9

55-8 55-3

55-3

55-1

55-3 55-1

SS-o

52-4

57.8 57-7

58.1

54-3

54-4 54-6

54-6 52.2

52.1 52.9

$16.68 16.02 16.00 i5-7o

14.42 14.50

14.84 14-57

14.76 15-54

15-54 15-45

15-39 16.24

16.25 21.31

8.19 8.21

8.32 8.35

8.32 8. 5 6

8.56 9.06

9.06 9.66

144 139

149 149

160 39

* From Table A. — Wages and Hours of Labor in the Boot and Shoe Industry, tgoy to iqiS. U. S. Bureau of Labor Statistics.

THE SHOE INDUSTRY

TABLE XXI. — Concluded

Finishing Department — Concluded

13 establishments.

31 establishments...

Treers or ironers, machine, male: 14 establishments...

23 establishments...

1916 1918

1918

1916 1918

1918

139 123

236 140

S3-i S2.3

55-3 52.8

• 234 .232

.360 •373

9-93 12.17

14-77 18.71

19.36

46

16,5

Table XXII. * Average and Classified Full-Time Hours per Week and Rate of Wages per Hour, and Average Full-Time

Weekly Earnings, by States, 1918.

Occupation, sex, and State

Number of establishments

Number of employ-

Average

full-time

hours per

week

Average

rate of

wages per

hour

Average full-time

weekly earnings

Finishing Department

* From Table C. — Wages and Hours of Labor in the Boot

and Shoe Industry: IQ07 to iqi8. U. S. Bureau of Labor Statistics.

THE SHOE INDUSTRY

Table XXIII. * Average and Classified Full-Time Hours per Week and Rates of Wages per Hour, and Average Full-Time Weekly Earnings, in the United States, by Years, 1907 to 1918.

Other Employees f (all Departments)

Male: 81 establishments. ..

130 establishments

143 establish ments

Female: 80 establishments

129 establishments

142 establishments

748 803

942

373

* From Table C. — Wages and Hours of Labor in the Bool and Shoe Industry; IQ07 to iqi8. U. S. Bureau of Labor Statistics.

t In miscellaneous minor or unskilled operations not included in the tables already given in this and other chapters.

FINISHING, TREEING, AND SHIPPING 261

Table XXIV. * Average and Classified Full-Time Hours per Week and Rates of Wages per Hour, and Average Full-Time Weekly Earnings, by States, 1918

Occupation, sex, and State

Number of establishments

Number of employees

Average

full-time

hours per

week

Average rate of

wages per hour

Average full-time

weekly earnings

Other Employees t (All Departments)

* From Table C. — Wages and Hours of Labor in the Boot and Shoe Industry: 1907 to iqi8. U. S. Bureau of Labor Statistics.

t In miscellaneous minor or unskilled operations not included in the tables already given in this and other chapters.

CHAPTER XIII

EMPLOYMENT CONDITIONS, WAGES, AND HOURS OF LABOR

The Sex Division of Employees. Under normal conditions, in a shoe factory making both men's and women's shoes of the ordinary kinds, substantially the following percentages of labor are found:

Male employees, sixty-nine per cent.

Female employees, thirty-one per cent.

Boys under eighteen years, one-seventh or fourteen per cent

of male employees.

Girls under eighteen years, one twenty-fifth or four per cent of female employees.

These percentages may be given as fairly exact for the average shoe factory and for the boot and shoe industry as a whole. In factories making mostly heavy shoes or men's wear, however, the proportion of male employees runs somewhat higher than the sixty-nine per cent, and that of female employees lower than the thirty-one per cent. On the other hand, in factories making women's, children's, and infants' footwear, there will be found some increase in the percentage of female employment with a corresponding decrease in the male.

EMPLOYMENT CONDITIONS

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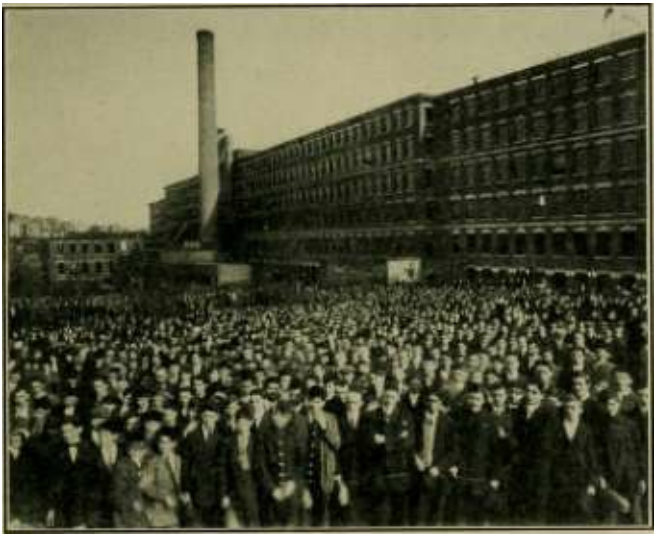
In studying the departments of shoe manufacture we have seen that the more difficult processes and the operation of heavy machines are given regularly to male employees. This is especially true in the



Shoe Workers of the Thomas G. Plant Company, Boston, Mass. Copyright, Photo News Co.

cutting department, in some divisions of the stitching department, in the sole leather department, in the gang room, and in treeing. On the other hand, the lighter processes and the simpler machines are regularly given to girls and women, especially in stitching, finishing, dressing, and packing. During the recent war, however, women were employed upon some of the machines usually run by men.

Further statistical information upon employment in the shoe industry, in comparison with other leading industries, is given in Table XXVII on page 284.

The Divisions of Employees Among Departments. To enable

a factory to work as a whole with all operatives in all manufacturing departments equally busy each day, the division of employees among departments must have about the percentages following:

In the cutting room, twelve per cent of all operatives.

In the stitching room, twenty-seven per cent. In the sole leather room, twelve per cent. In the gang room, twenty-three per cent. In finishing, eight per cent. In treeing and dressing, ten per cent.

Small numbers of employees, making perhaps seven or eight per cent, are found in minor departments of the factory.

At the same time the business offices employ from nine to ten per cent of the total number of people connected with the industry.

Shoe Manufacture Highly Specialized. Shoe manufacture has become more and more highly specialized in recent years. Each factory can produce a larger output with smaller costs when making

only a single or a few kinds of footwear. The large American market has greatly aided in this specialization; an increased

trade abroad, in about ninety different countries at the present time, makes it still more profitable for the American shoemaker to devote his plant to a single line of product in the

The First Factory of Thomas G. Plant

assurance that he will find a steady market. We find, then, factories, for example, making men's heavy work shoes, leg boots, walking shoes, or shoes for dress wear; and other factories making footwear for women, children, and infants, exclusively. At the same time we find the long list of - factories manufacturing special parts and findings. Seasons. One of the chief objections to entering

into shoe manufacture is the fact that it is a seasonal employment. The busiest seasons are the fall and winter; the least busy season is the summer, with an average idle period

of from three to eight weeks, coming usually in or around the month of July. As has been said earlier, the progressive shoe manufacturers are making great efforts to obtain orders far enough in advance, and to study trade conditions, so that a year's steady employment may be provided for the factory. Large concerns capable of handling extensive contracts may do this more easily; the small concern with a limited trade must adjust its output to its volume of trade and suffer usually from an idle season.

In a few rare cases factories having large contracts or accumulations of orders make a twenty-four hour day, with three full shifts of employees working in eight-hour periods.

Shoemaking a Trade. Shoemaking is a trade, with many specialized divisions. Some of these divisions, such as the simpler operations in the various rooms, are distinctly unskilled trades; others, like cutting, welting, and trimming edges are highly skilled trades. The first kind calls for a very brief period of learning, sometimes a few days only; the other division includes processes requiring in many cases several months or even years for learning.

The operator may learn several related processes,

but in the large factory he remains essentially a worker or an expert in one.

Entering Upon Work in a Shoe Factory. In a small shoe

establishment, and quite regularly in a country town, inexperienced persons may be taken in to learn most processes. Persons thus learning branches of shoe manufacture quite often enter the large factories as experienced operators. In the large factories, especially in the great shoe centers, inexperienced persons are taken in only for the minor processes, and more often in the stitching than in other departments. There is quite a steady movement of the more highly skilled shoe operatives from factory to factory, and from one shoe center to another.

Promotion. The operator who can perform several processes in shoemaking is usually kept upon the process in which his work is most needed at any time. Frequently a worker showing a special aptitude for an advance process is put forward to learn it, and given permanent promotion if he becomes expert in it. There is not, however, such a gradation of operations in the departments of the shoe factory as to offer promotion regularly or to the many. The most conspicuous promotion is that of a workman who comes to understand the work of a room fully, with ability to direct others, to the position of assistant foreman or foreman.

Securing Skilled Labor. The desirabilty of securing employees that are skilled in their respective branches of work is appreciated in every industry, and in none more so perhaps than in the shoe industry. The truth of this assertion is evidenced by the methods of securing employees in different shoe manufacturing centers.

" In some of these centers shoe manufacturers cooperate through their local association in keeping records as to the workmanship and character of their employees which have some bearing upon future employment. In other places each factory may have a bulletin board on which it makes known the classes of employees that are desired, but in both cases the kind of an operator that is wanted is specified, and this in itself is an indication of the desire of the concern to engage a skilled employee for that particular operation.

" We are sometimes told by thoughtless persons that the amazing improvement in shoe machinery that has been witnessed in the last fifty years has practically eliminated the skill of the shoe operative. It would perhaps be more proper to say that the larger use of vastly improved machinery, subdividing the labor of shoemaking as it has, has simplified shoemaking to the extent that it is much easier to manufacture skilled employees in the shoe factory of today than it was in the shoe factory of fifty years

ago, when it was necessary to teach the shoe operative much more of the shoemaking art than he needs to know at the present time." x

The Shoe Superintendent. The superintendent of a shoe factory or of a department or room must be first of all a manager. He need not necessarily have exact knowledge of processes, but he must know much of resources, materials, equipment, employees, and of methods of efficiency and

improvement in employment conditions. He must be able to work through subordinates and yet keep a firm and helpful hand on the activities of manufacture.

The superintendent usually comes to his position from the business side of the industry. Young men are trained for this work in some factories by a period in office service, of from six months to several years, followed by service in the factory long enough to make them familiar with the general features of manufacture.

The superintendent may be a member of the firm or corporation, a stockholder, or simply an employed officer. His salary, as in other great lines of manufacture in present times, may vary from some hundreds of dollars in a small factory or department to many thousands of dollars in the great corporation.

The Shoe Foreman. The shoe foreman, on the other hand, rises from the bench or is promoted from

1 Superintendent and Foreman, Boston, August 26, 1014.

the machine. He must have intimate knowledge of processes and be able to train employees in them; he must be able to select operators for his department and to make their work efficient; he must be a master of method, of handling men at work, and of maintaining discipline in his room, tactful, firm, friendly with all, yet not forfeiting their obedience and

respect.

The position of the foreman is exacting. He stands between the superintendent and the operator and is responsible for the work in his department. He must keep every employee occupied and the work passing through on schedule time. His pay is usually about the same as that of the most expert operators in his room, varying from $15.00 upwards a week, reaching $50.00 or $60.00 in some cases.

Forewomen are employed in divisions of the stitching room or in small departments in which the employees are mostly girls or women.

The superintendents and foremen of a factory usually hold weekly meetings for the discussion of topics of mutual interest and helpfulness.

Assistant superintendents and foremen receive salaries graded below the amounts given, according to the responsibility and service demanded.

There is considerable change of foremen among shoe factories, more, probably, than of other officers or employees. In every shoe journal advertisements like the following are constantly appearing:

" POSITION WANTED as foreman of sole leather room. Experience on welts, turns, and McKays, and can operate all

machines. Also, expert on new economy-insole. Best of references. Address, , care of

American Shoemaking."

The Quality Man and the Quantity Man. Some factories have, in addition to superintendents and foremen, a person whose special duty is to examine all work being done in a department for its quality of workmanship and another person who observes all work for its quantity, so that each room is held up to the standard set by the factory both in grade and volume of product. These persons are practically assistants to the foremen, yet responsible to the factory management only. With them, the foreman can give his time more fully to training and supervising employees. On the other hand such a multiplication of supervisors,—superintendent, foreman, and inspectors,—is likely to bring uncertainty as to authority and confusion of oversight.

The quality and quantity men have about the same rank and pay as foremen.

The Efficiency Engineer. Some large concerns employ a person skilled in efficiency methods. His work in the factory consists in studying methods and processes so that the best results may be obtained with the least expenditure of time, with the least wear of machinery, and with the most economical use of materials possible. When his duties

deal with the operations of manufacture he is usually called an efficiency engineer. He is a specialist in work belonging more naturally to the' foreman, and attended to by the foreman or his assistant in the smaller establishments.

The efficiency engineer must have a very accurate knowledge of the nature of machine operations, of the qualities of materials, of the factory schedule, of the mental and physical qualities of the operative, of the effect of monotony and routine, and of the value of encouragement and incentive for the worker.

The Shoe Factory Chemist. There are numerous chemical companies which produce the materials used in tanning leathers and in finishing shoes. In recent years, however, some large shoe factories have drawn chemists from such establishments or from other sources to work steadily in the factory. The duties of such chemists are twofold: To examine all leathers purchased to see that they have been properly tanned and cared for, and to examine all finished materials, to see that they are of the right quality. A few factories have laboratories in which the chemist makes finishing materials from formulas which can be purchased or from his own or the factory formula.

The salary of the shoe factory chemist, whose service is of high value in shoe manufacture, ranges from $20 or $25 a week upwards.

Piece and Time Payment. Two-thirds, or about sixty-six per cent of the processes of boot and shoe manufacture, are paid for on a piece basis, usually at a fixed rate per dozen pairs. Such processes are those in which good work can be done at high rate of speed, and in which the possibility of increased earnings produces a larger volume of work from the shoe operator. On the other hand, where accuracy and care are required, as in the cutting room, and where work is of a routine nature, as in shipping, pay rests upon a time basis.

The Best Paying Processes. Some of the best paying processes in the factory are, cutting, stitching, lasting, wiping in, welting, rounding, trimming and edge setting. The pay in these processes ranges from $20.00 to $40.00 or more per week.

Wages and Hours of Labor in the Shoe Industry. Wages have been given in statistics at the ends of the chapters on factory departments, in each for the occupations in a given department.

From the table which follows, on page 276, showing relative full-time hours per week, hourly earnings, and full-time weekly earnings, in the principal occupations from 1910 to 1918, we may note the increases of 1918 over the index numbers of 1913, or 100 per cent, and compute average per cents of increase. It will be observed that the smaller increases for this five year war period were for heelers

and heel trimmers among male employees, and for hand treers among female employees. These increases were only 13 per cent. At the same time Goodyear welters and rough rounders, both among the most important operators, were advanced only 17 per cent. On the other hand, bed machine operators and turn lasters received an advance of 43 per cent. The average per cent of increase in the forty occupations between 1913 and 1918 was 27^ per cent.

This average increase of earnings in the industry may be looked upon as permanent. The higher wages paid, no doubt, in some shoe factories since 1918, in keeping with the general raising of wages in industry, are likely to be reduced somewhat, approaching the rates found in 1918.

To aid in making comparisons from year to year, relative or index numbers have been computed for the years 1910 to 1918 inclusive. These numbers are based on the averages showing in the general tables appearing at the ends of the chapters of this volume which treat of the departments of shoe manufacture. • It will be observed that in the period taken there was a universal relative decrease of 6f per cent in full-time working hours per week, while relative earnings increased as shown above.

Following is the index number table. In connection with it is presented a table showing for each

occupation the actual hours and earnings of employees in

comparison with full-time hours and earnings in a given week in 1918. There appears to be a general falling off in actual figures, running as high as eight or ten per cent. This would not ; of course, be true of factories operating on full-time in busy seasons, and best represents the industry, perhaps, in an average time when production is easily keeping up with distribution.

THE SHOE INDUSTRY

Table XXV. * Relative Full-Time Hours per Week, Hourly Earnings, and Full-Time Weekly Earnings, 1910 to 1918, in the Principal Occupations.

(1913 = 100)

Department, occupation, sex, and year

3 o

Pi

+3 c =3 C

Department, occupation sex, and year

B-^

?2?

CUTTING DEPARTMENT

Cutters, vamp and whole shoe, hand, male:

igio

1911

1912

iQi3

1914

1916

1918

Cutters, vamp and whole shoe, machine, male:

1910

1911

1912

1013

1914

1916

1918

Skivers, upper, machine male:

1910

1911

1912

1913

1914

1916

1918

Skivers, upper, machine female:

1910

1911

1912

1913

1914

1916

1918

SOLE-LEATHER DEPARTMENT

Cutters, outsole, male:

1910

1911

SOLE-LEATHER

department — Concluded 1912

1913

1914

1916

1918

Channelers, insole, and outsole, male:

1910

1911

1912

1913

1914

1916

1918

fitting or stitching department Tip stitchers, female:

1911

1912

1913

19*4

1916

1918

Backstay, stitchers, fe male:

1910

1911

1912

1913

1914

1916

1918

Lining makers, female:

1910

1911

1912

1913

1914

1916

1918

93

100

IOO IOO

134

94

IOO

IOO 99

126

90

IOO

99 122

95 95

100 99

106

94

98

97

100

IOO

107 127

90

IOO

99

103

H9

* Table 2. — Wages and Hours of Labor in the Boot and Shoe Industry: 1007 to iqi8. U. S. Bureau of Labor Statistics.

EMPLOYMENT CONDITIONS

TABLE XXV. — Continued

277

Department, occupation, sex, and year

Department, occupation, sex, and year

FITTING OR STITCHING

department — Concluded Closers-on, female:

1010

igu

1912

1013

1914

1916

igiS

Topstitchers or under-trimmers, female:

1910

ion

1912

1913

iQU

1916

1918

Button fasteners, female:

ign

1912

1913

I9U

igi6

1918

Buttonhole makers, female:

ign

1912

1913

1914

1916

1918

Vampers male:

igio

1911

1912

1913

1914

1916

1918

Vampers, female:

1910

1911

1912

1913

1914

1916

1918

LASTING DEPARTMENT

Assemblers, for pulling-over machine, male:

1911

1912

1913

1914

1916

1918

Pullers-over, hand, male:

1910

1911

1912

1913

1914

1916

1918

Pullers-over, machine male:

1910

1911

191 2

1913 •

1914

1916

1918

Side lasters, hand, male:

1913

1914

1916

1918

Sidelasters.machine.male

1913

1914

1916

1918

Bed-machine operators male:

1910

1911

1912

1913

1914

1916

1918

Hand-method lasting-ma chine operators, male

1910

1911

1912

IOO

102 106

139

95 95

100

105

104

134

95 .94 90

IOO IOI

106

IOO IOI

103 139

IOO

103

IOO

134

96

99

92

IOO

96

105

THE SHOE INDUSTRY

TABLE XXV — Continued

Department, occupation, sex, and year

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6 w S c .J. "3 3 53

2^4

Department, occupation, sex, and year

■a j>(

LASTING DEPARTMENT —

Concluded Hand-method lasting-machine operators, male:

1913

1914

igi6

1918

Turn lasters, hand, male:

1912

1913

1914

igi6

1918

BOTTOMING DEPARTMENT

Goodyear welters, male:

1910

ign

1912

1913

1914

1916

1918

Rough rounders, male:

1910

1911

1912

1913

1914

1916

1918

Goodyear stitchers, male:

1910

1911

1912

1913

1914

1916

1918

McKay sewers, male:

1910

1911

1912

1913

1914

1916

1918

Heelers, male:

1911

102 101 101 100 100 99 95

103 102

101 100 100 99 95

102

101

101

100

99

99

95

103 102 101 100 100 99 95

100 101 99 119

94 97 94

100 104 109 132

9i 93 90

100 108 113

141

95 100 103 108 125

93 94 90 100 107 112 133

BOTTOMING DEPARTMENT

— Concluded Heelers, male :

1912

1913

1914

1916

1918.

Heel trimmers or shavers male:

1910

1911

1912

1913

1914-•

1916

1918

Heel breasters, male:

1911

1912

1913

1914

1916

1918

Edge trimmers, male:

1910

ign

1912

1913

1914

1916

1918

Edge setters, male:

1910

1911

1912

1913

1914

1916

1918

Heel scourers, male:

1911

1912

1913

1914

1916

1918

Heel burnishers, male:

1911

1912

91

IOO

95 101 "3

93

99 54

100 98 99

"3

94 95 100 97 102 126

95 96 93 100 97 102 126

92 93 92

100 98 99

121

93 93 100 97 108 132

97 93

EMPLOYMENT CONDITIONS

TABLE XXV — Concluded

279

Department, occupation, sex, and year

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Department, occupation sex, and year

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BOTTOMING DEPARTMENT

— Concluded Heel burnishers, male:

1013

1014

igi6

1918

Buffers, male:

1911

1912

1913

1914

1916

1918

FINISHING DEPARTMENT

Treers or ironers, hand, male: 1910

100 100 100 95

101 101 100 100 99 95

FINISHING DEPARTMENT

— Concluded Treers or ironers, hand male:

1911

1912

1913

1914

1916

rgi8

Treers or ironers, hand female:

1910

1911

igi2

1913

1914

1916

1918

95 95 100 99 105 137

96 97 97 100 106 116 "3

THE SHOE INDUSTRY

Table XXVI. * Average Full-Time Hours, Hours Actually Worked, Fulltime Weekly Earnings, and Amounts Actually Earned During One Week, igi8.

[This table does not include data from 7 establishments having biweekly pay rolls.]

Occupation and sex

"I

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cutting department

Cutters, vamp and whole shoe, hand, male:

Cutters, vamp and whole shoe, machine, male

Skivers, upper, machine, male

Skivers, upper, machine, female....

sole-leather department

Cutters, outsole, male

Channelers, insole and outsole, male

FITTING OR STITCHING DEPARTMENT

Tip stitchers, female

Backstay stitchers, female

Lining makers, female

Closers-on, female

Top stitchers or undertrimmers, female

Button fasteners, female

Buttonhole makers, female

Eyeleters, female

Vampers, male

Vampers, female

LASTING DEPARTMENT

Assemblers, for pulling-over machine, male

Pullers-over, hand, male

Pullers-over, machine, male

Side lasters, hand, male

Side lasters, machine, male

Bed-machine operators, male

Hand-method lasting-machine operators, male

Turn lasters, hand, male

Turn sewers, male

BOTTOMING DEPARTMENT

Goodyear welters, male

Rough rounders, male

Goodyear stitchers, male

McKay sewers, male

63

23

116

73 116

119 118 126

129 61

87 81 126

95

35

117

41

54

2,263

1,169

96

668

410 259

419

535

1,097

344

i,3I5

99

137

216

565

1,406

697

344

386

284 1,265

39° 729

455 275 658 196

52.1

50.9

5i-7

52.1 52.5

Si.S 5i-8 5i-4 52.0

51.6 52.7 52.2 51-7 51.4 5i-7

52.5 Si-7 52.6 5i-8 52.2 52.1

52.8 53-8 53-6

52.2 52.4 52.3 S2.8

46.6

46.4 46.8

49.8 49.6

46.7 47.0 46

47-3 48.4 48.5

47-7 50.6 51.2

47.1 48.4 48.7

$25.16

23.S6 21.55 13.82

14.98 13.58 12.44 12.30

14-55 12.05 13-67 13-58 22.81 16.24

20.92 24.62 26.75 22.63 24-39 25-97

25.38 24.37 26.82

32.35 32.06 27.56 23.58

$22.46

21.12 19.50 12.51

20.30 21.10

13-51 12.31 11.17 11.02

13.42 11.00 12.26 12.68 21-45 14.38

18.81 22.85 24-57

21.15

22.99

24.37

23.09 22.90

25.63

28.84 28.39 25.69 21.32

* Table 4. — Wages and Hours of Labor in the Boot and Shoe Industry: IQ07 to iqi8. U. S. Bureau of Labor Statistics.

EMPLOYMENT CONDITIONS

Table XXVI — Concluded

28l

Occupation and sex

£3

3 Ji « 1>

2 £ >.*

Heelers, male

Heelers, wood, male

Heel trimmers, or shavers, male.

Heel breasters, male

Edge trimmers, male

Edge setters, male

Heel scourers, male

Heel burnishers, male

Buffers, male

FINISHING DEPARTMENT

Treers or ironers, hand, male. . . Treers or ironers, hand, female.. Treers or ironers, machine, male

ALL DEPARTMENTS

Other employees, male

Other employees, female

130 18 122 107 131 132 122 123 124

in

29 23

136

135

24.65 24.56 26.25 20.19 26.32 25-75 21.23 21.00 20.64

20.07 n.33 18.20

16.24 10.81

The accompanying graphic chart* is based upon the percentages of figures gathered from eighty-three representative establishments throughout the country.

In some establishments the regular pay-roll period covers two weeks. Of this twelve-day working period the factories whose number of employees and pay roll were the basis of the preceding chart, were in operation 11.4 days. This was in the proportion of ninety-five per cent of the working days of the year ending in February, 1914, or 48.4 weeks, leaving the equivalent of an average idle period of 3.6 weeks.

1 Wages and. Hours of Labor, 1007 to 1914 — Boots and Shoes. U. S. Department of Labor, Bureau of Labor Statistics.

It will be observed by the chart that the number of employees does not vary greatly throughout the year from the normal of one hundred per cent, but that the pay roll and earnings do vary considerably,

APR. MAY

JUNE JUIY

SEPT OCT

CENT

' CENT 140

APR MAY JUNE JULY

SEPT OCT NO" DEC

Variation in Number of Employees, Total Pay Rolls, and Biweekly Earnings per Employee

according to seasons, being highest in March, August, December, the latter part of January, and February, and lowest in April, July, September, October, and the early part of January. In the busy season individual earnings are at a maximum; in the dull season, with fewer hours, they are at a minimum.

Sex and Age Distribution of Wage Earners in the United States by Leading Industries: 1909. Table XXV, the latest of its kind now.available, shows, for the forty-three leading industries, the number and

per cent of distribution, by age and sex, of wage earners as reported for December 15, or the nearest representative day. It does not include salaried persons. As a means of judging the true importance of the several industries as employers of labor, the average number employed for the entire year is also given in each case, this number, in the case of seasonal industries, being much smaller than the number on the representative day. The per cent of distribution for all industries combined, based on the average number employed, is also presented.

In all the industries combined in this table, seventy-eight per cent of the average number of wage earners were males sixteen years of age or over, 19.5 per cent females sixteen years of age or over, and 2.5 per cent children under the age of sixteen.

In all industries combined 78.5 per cent of the average number of wage earners in 1914 were males sixteen years of age or over, 19.7 per cent females sixteen years of age or over, and 1.7 per cent children under sixteen years of age.

THE SHOE INDUSTRY

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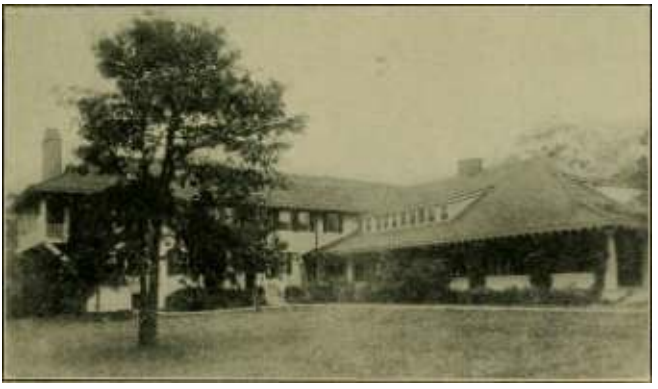
The industries for which the largest proportions of males sixteen years of age or over are shown are those in which the work is of a nature requiring considerable physical strength or a high degree of skill.

The proportion of women and children, naturally, is larger in those industries in which the processes require dexterity rather than strength.

The importance of the shoe industry as a field of employment, in comparison with the other staple industries, may be seen by this table.

The average number of wage earners employed in the industry during the year is 93.7 per cent of the total number employed on the day taken by the Census Department as properly representative. Of those sixteen years of age or over, 62.6 per cent are males, and 33.3 per cent are females. The percentage under sixteen is 4.1 of the whole number.

The Monotony of Shoemaking. Like those of many other kinds of manufacture the machine processes of shoemaking are monotonous. The hand processes are in general of a lighter and less wearing nature, and are not so distinctly characterized by monotony. Operating an automatic machine, however, upon which materials or parts of shoes must be placed and controlled in an unvarying time period, is depressing and wearing for the operator. In a



Employees' Club House, George E. Keith Company, Brockton, Mass.

sense he becomes a part of the machine until he may almost seem to have little mental or physical activity aside from it.

There are several possible offsets to monotony in shoe manufacture. One is an incentive to speed, which, while in itself a wearing element for the workman, has a speeding up effect upon him in the case of payment by piece. He works faster, and in many cases accomplishes a full day's work in less than a full day's time, thus gaining for himself some hours of the working day to spend outdoors or at home. It is a common thing to enter the gang room of a shoe factory, for instance, towards night and find some machines idle because the operators upon them have performed their work on the lots of shoes passing through the room on that day.

A second offset is found in the advantage to the operator of learning to run more than one machine, so that at times he

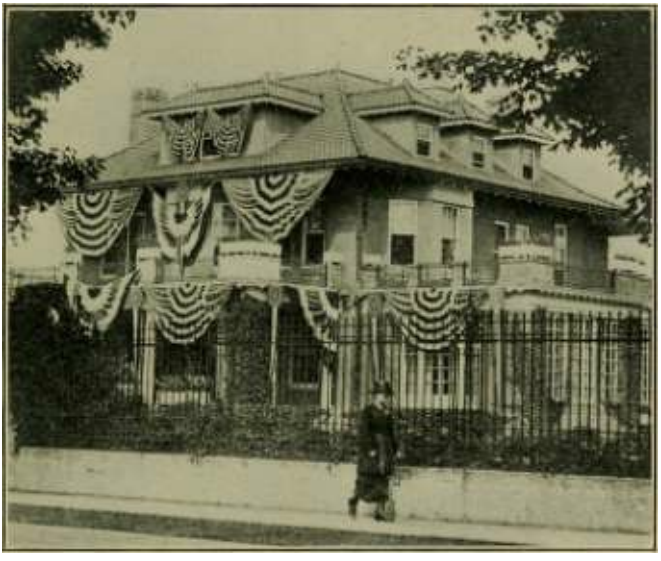
may be transferred from one to another.

It is a relief and often a pleasure to the mind of the worker to have to handle leathers and other shoe materials of high grade and finish.

Another means of lessening monotony lies in the operator's being able to care for his own machine, to understand its parts, or to suggest improvement upon it. This kind of ability, which is much sought

after in the shoe factory, often leads to promotion and to work upon more important machines.

Quotation upon Efforts in Some Factories to Lessen Monotony. The following quotation indi-



" Ideal Home," Library and Clubrooms, Endicott, Johnson and Company, Endicott, N. Y.

cates the tendency of the present time to ameliorate the effects of monotony:

" In some German factories the routine of the day is broken by a recess in the morning and in the afternoon. In a western factory, which makes supplies for the shoe trade, there is a morning and afternoon recess for employees. Lunch is served during the recess. Some of the

employees work as waitresses. In a number of shoe factories there are now rest rooms for women.

" In some high-class American manufacturing establishments, the grounds about the factories are made attractive. When an employee looks out of the window, he sees a cheerful prospect. This breaks the monotony of his task. It is possible that the American shoe factory system requires too steadfast an application of the worker to his machine. The enthusiasm with which shoemakers demand factory legislation, particularly short working hours, is a sign that this is so. Perhaps shoemakers would be more steady and more efficient if they had ten or fifteen minutes of recess in the morning and in the afternoon. The idea may seem radical, perhaps preposterous; but it's pretty certain that something will be done the next few years to break up the monotony of the task of shoemaking." x

Social Service in the Shoe Factory. Some large factories conducted under modern conditions take measures for the occupational and social welfare of their employees. They provide classes for training, in some features, at least, of the work of the factory; separate rooms for rest and recreation, dancing, and social clubs for male and female employees; libraries equipped with books and magazines relating to shoe manufacture, and with general literature; restaurants conducted on a co-operative basis, or at low rates, so that employees may afford to patronize them; medical attendance and equipment; and sometimes elaborate parks and playgrounds.

1 American Shoemaking, Boston, October 18, 1913.

Quotation from a Government Study of Social Service. The best summary of social service, or welfare work ; as it has long been called, in the shoe industry, is to be found in the report upon Em-

Men's Recreation Room, Thomas G. Plant Company, Boston, Mass.

ployers' Welfare Work, published by the Bureau of Labor Statistics at Washington, 1913, as follows:

" The Shoe Co.,

has done much to improve working conditions for its 5,000

employees. The huge factory is built in the form of a hollow square, so that all the workrooms are well lighted. On the top floor, where the shoe leather is cut, the roof has saw-tooth skylights to increase the light.

The ventilation throughout the building is admirable, and every effort is made to keep down dust. The lavatories are very sanitary and clean. Individual lockers of perforated iron are placed about in the workrooms near the machines, and are turned over to employees on their making a small deposit — enough to cover the cost of the key. There is a check-room for umbrellas and wet garments. Separate elevators are installed to transport the women employees to the upper floors. The company has a lunch counter for the employees, where food is sold at cost. Employees who bring their lunches eat them in the workrooms.

" Apart from good workroom conditions the company conducts recreation work — the name it gives the usual welfare work. The ground around the building has been converted into a noonday-rest park for the employees, with a beautiful, trim, green lawn and flowers. There is besides a roof garden covering over half of the roof space. Part of this is reserved for women and part for men, with separate stairways leading to each section. A dance hall for women open at noon and on special occasions in the evening, a pool room and bowling alleys for men, open every evening after working hours until ten o'clock give the much-needed amusement. The men pay a small fee for the use of the tables

and the alleys. A handsomely furnished reading room, with attractive ferns and flowers from the company's greenhouse, has been opened to the employees. There is a branch station of the City Public Library here, besides books owned by the company and numerous weekly and monthly periodicals.

" A woman physician, constantly in attendance, has the medical care of the employees under her supervision.

EMPLOYMENT CONDITIONS

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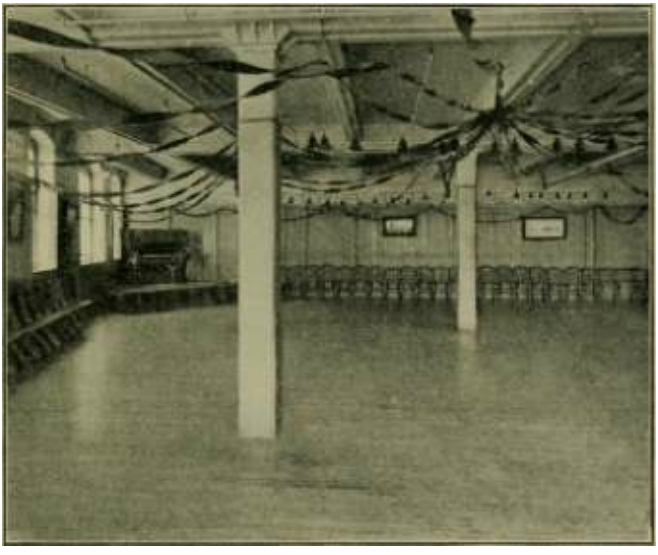
There are rest rooms and an emergency hospital, with a nurse regularly employed in the building. Twice a week an oculist spends the forenoon at the factory and may be consulted free by the employees. He fits them with glasses at very reduced prices.



Dancing Hall, Thomas G. Plant Company, Boston, Mass.

" The company, with the aid of employees' dues, maintains the Relief Fund Department. Out of this fund, sick, accident, and death benefits are paid. There is at present over $5,000 in the treasury. The dues are ten cents each week for adults and five cents for employees under twenty years of age, and they are deducted from wages by the paymaster's department. In case of sickness or accident the members receive $7 and

$3.50 a week. No member can draw benefits longer than seven weeks in one year. Benefits do not become due until the member has been incapacitated one week, except in case of severe injury. At death $100 or $50 is paid the beneficiaries of the deceased, according to the amount of the weekly dues. A medical examiner is employed to report

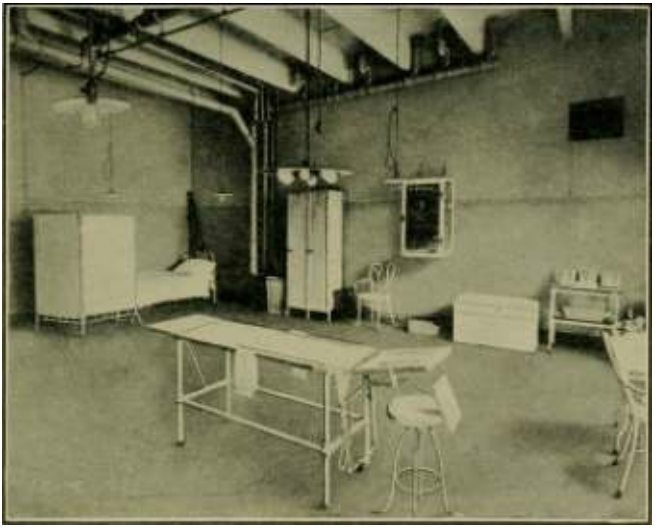
upon the condition of disabled members and to decide upon the members' claims for benefits. The administration of the relief fund is entirely in the hands of the company, and all the receipts of the fund are held by the company in trust for the relief department."

General Sanitary Conditions Observed in Boot and Shoe Factories. 1 The general sanitary conditions, dangers, and injurious processes in shoe factories have been clearly presented in the report of the Massachusetts State Board of Health for 1912, upon the Hygiene of the Boot and Shoe Industry in Massachusetts. As this State has always been the center of the industry in this country, and as its factories, some six hundred in number, are typical of the American shoe factories, the facts presented in this report may be considered fairly typical of the industry at the present time. The following is taken from the report:

" The construction, location and interior conditions of the shoe factories of Massachusetts vary so widely, even in the same community, that it is difficult to formulate

1 Hygiene of the Boot and Shoe Industry in Massachusetts, State Board of Health, 1912.

general statements which would be applicable to all of them. Not a few of these factories are located in small country towns and are operated by employees descended from generations of shoemakers. These factories are generally isolated and, because of the absence of neighboring structures, quite well lighted. On the other hand, in



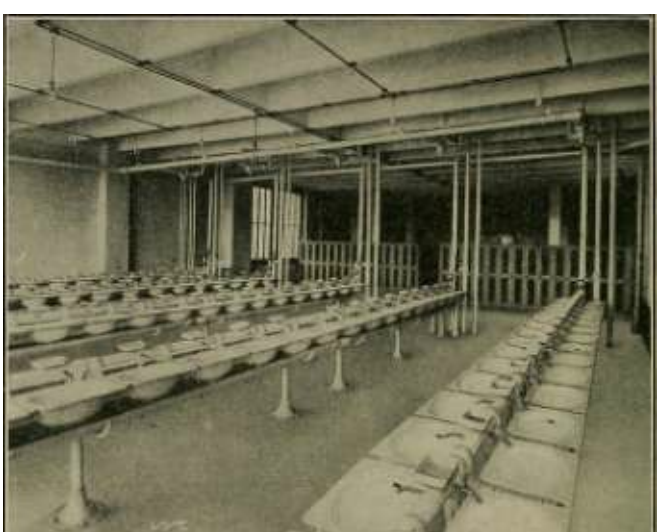
Factory Hospital, United Shoe Machinery Corporation, Beverly, Mass.

the cities, where all available space is utilized, the buildings are at times crowded together, impairing the lighting conditions of the workrooms. It should be remembered, however, that, unlike the textile industry, the operatives in shoe factories work at machines or at benches placed along the sides of the rooms near the windows. The only exception

to this may be found in the stitching

rooms, where the operatives work in all parts of the room. This room, however, was as a rule found well lighted in all establishments visited.

" It is to be noted that the modern buildings constructed for the shoe industry have been so placed that neighboring structures cannot shut out natural illumina-



Wash Room, United Shoe Machinery Corporation, Beverly, Mass.

tion. This feature of construction has proved a valuable asset

to those who have constructed these buildings. Note has already been made of the use of electricity as an artificial illuminant.

" The laws of Massachusetts require that all factories be kept clean and well ventilated, and these laws are well observed.

" The odor of leather is inseparable from the art of

making shoes, as is the odor of wool and of cotton in the textile industry.

" One of the most vexing problems that has arisen in the inspection of shoe factories has been the maintenance of proper toilet facilities. This question, by no means common to the shoe industry, can only be met through repeated inspections and the education of the manufacturer. It is not that the manufacturer is not willing or does not desire to maintain proper toilet facilities, but he is oftentimes careless and leaves this part of the work to others who fail in their duty. A decided improvement in these conditions has, however, been noted."

Conditions in 483 Factories, as to Light, Ventilation, and Water-closets:

Light:

Excellent 30

Good 441

Moderately bad 2

Distinctly bad 10

483 Ventilation:

Excellent 7

Good 468

Moderately bad 3

Distinctly bad 5

483 Water-closets:

Excellent 6

Good . . 415

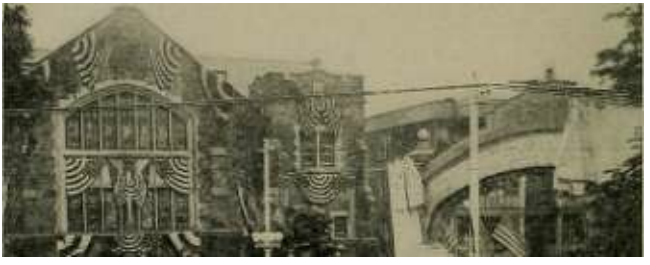
Moderately bad 7

Distinctly bad 55

483

For further information on health conditions in shoe manufacture the reader is referred to the re-

port from which the preceding quotation has been made. In that report he will find an exhaustive discussion, with numerous diagrams, of the injurious features of the occupation. There is danger in operating most machines, which can, however, be



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Spirit and Loyalty. On Labor Day, in a pouring rain, 15,000 Endicott Johnson workers dedicate the " Square Deal Arches." These arches are of granite, erected at Johnson City and Endicott, costing $32,000 and financed entirely by the workers

avoided with due care on the part of the operator; there is danger, also, from the fumes of naphtha, from cement used in the stitching room and making room; and while dust removers are in general use, under the compulsion of state legislation, there is

considerable menace to the health from dust which is produced by nearly all processes of work upon the bottoms of shoes, such as edge trimming, bottom scouring, buffing, and bottom finishing.

The Employment of Handicapped Men in the Shoe Industry. Many of the minor processes of shoe manufacture and a considerable number of the major processes can be performed by handicapped men. The industry offers numerous opportunities for such workers to earn a fair living or even high wages and salaries. Its 1400 factories are established in all sections of the country, and each factory employs hundreds or thousands of operatives. The place, moreover, of the industry is among the great staples whose products are in ever increasing demand. Such industries must have workers, and must, if necessary, modify their processes to the abilities and condition of the workers available from time to time.

Shoe manufacturers are ready to employ men who have disabilities. If such men have formerly been employed in the industry they can enter it again the more easily; if they have not done .shoe work, they can learn some part of it in a comparatively brief time. The employer in the great shoe centers especially welcomed the returned soldier, who has on the whole good mental ability. It has been necessary in these places to hire considerable alien help, which has only an economic interest in the

service it performs. Furthermore, the employment of handicapped men in the shoe factory will lessen the increasing danger of an over-employment of women in the harder and more wearing divisions of the occupation.

The view of the manufacturer is well expressed in the following statement by the superintendent of one of the great factories in the vicinity of Boston, when a recent investigation of opportunities for the handicapped was being made by the author in this factory:

Work here depends on the man more than on freedom from handicap. A person willing to take hold and learn may do something with almost any handicap. An operative here who loses several fingers or a thumb may keep his place on almost any job. So one blind in one eye may still work; those deaf and dumb may work here successfully. We have this morning hired four inexperienced men who are both deaf and dumb. They will be put upon machines and trained as shoe workers.

Of specific disabilities it is necessary here to speak but briefly. Loss of legs will not incapacitate a man in the industry. He may work at many operations sitting. Plans are now being considered to construct seats and benches for some of the heavy shoe machines at which the operator now stands. The great problem will be to enable the man who has lost one or both hands or arms to operate shoe

machines or do hand processes in the factory. A man of general strength and health who has almost any injury except in hands and arms may become a shoe operator. Manufacturers and inventors of shoe machinery are now considering methods of adapting shoe machines to handicapped operators by means of mechanical devices, air pressure, and electrical devices. Where now a foot pressure of eighty or one hundred pounds is used on the treadle of a heavy machine, by possible and contemplated improvements this pressure may be reduced ninety per cent, or the machine may even be operated by touching an electric button. Mr. J. B. Hadaway, consulting engineer for the United Shoe Machinery Corporation, made to the writer the following wisely conservative statement:

I think it possible in time to so arrange the machines that the difficulties which would be experienced by operators with crippled limbs will be partially overcome.

This is the statement of a leading authority in a great corporation which manufactures and leases shoe machinery for the bulk of the industry in this country today.

The conservative point of view upon the employment of handicapped men in the shoe industry may properly be presented here, that we may the better understand the industry and more intelligently esti-

mate its opportunities for workers who have disabilities of

any kind. Shoe manufacture is highly specialized and its operations are mainly performed on standard machines. The best paying operations are upon machines that call for the full strength of a person standing while at work, and require two good hands and two legs, healthy lungs, and strong chest muscles. There is also a great deal of moving about at most jobs, to do one's own work and pass it to the next operator, and quickness of movement and speed of machine are necessary for profitable earnings for the individual worker and for a satisfactory output in a factory department. It is just as necessary for a piece worker to work fast as for a day worker, since he must keep up to the rate of speed required by workers associated with him. All shoe parts being worked upon pass through one room after another on scheduled time, and no operative can be allowed to fall behind others. The shoe factory as a whole is no more efficient than the weakest link in the chain of workers.

As most operations are paid by the piece, the handicapped worker might receive lower wages, since no factory would increase its rate. It might become necessary, then, in part, to employ handicapped persons upon the less skilled operations now performed by women and girls, or boys, at the wages paid to these workers. This would displace such

workers in a degree, even if shoe manufacturers were willing to make the change; but manufacturers prefer women, girls, and boys for most of the work which they now do on account of their skill of hand, quickness, or steady

application to their work. Women, in particular, during the recent war, were employed in increasing numbers in the shoe factory upon the processes previously performed by men. In general, the output of these women proved greater than that of men formerly in the same processes, and a return to the earlier relative numbers of the sexes in the industry was not to be expected.

Mr. Sidney W. Winslow, Vice-president of the United Shoe Machinery Corporation, made the following statement:

Ninety per cent of our machinery calls for the use of both hands in holding the shoe up to the machinery in such a position that the machinery may operate upon the shoe step by step along the contour of the shoe, which means that the operator has to turn the shoe by hand and needs both hands to do so. This would, of course, prevent most of the hand cripples from being able to use 90 per cent of our machinery.

At most of our machines the operators stand while running them. Our Experimental Department has been going through our machines thoroughly with the idea of arranging that the operator may sit and operate these machines, having in mind the possibility of woman labor. This, of course, would make it possible for the leg cripples to run these machines.

These machines represent investments of millions of dollars and priceless patents. In some cases there are thirty or forty patents on a single machine. Changes in the machines,

therefore, will come very slowly, and generally only in the line of the perfection of a process.

Certain conclusions in regard to the problem of the employment of handicapped workers in the shoe industry are here presented:

i. Opportunities exist to a considerable degree in the major and to a large degree in the minor factory processes and in shoe repairing.

2. In the present scarcity of intelligent labor, employers will welcome the handicapped worker who desires to enter the shoe factory.

3. Leg handicap will not incapacitate a person for shoe work. The man with one artificial leg may stand at a machine; one with both legs gone or artificial may work sitting, especially after projected changes in machinery.

4. The main problem is one of hands and arms. Most of the processes in shoe manufacture require two good hands. Passing from early hand shoemaking to present machine shoemaking only adds intricacy to processes.

5. Defective sight and serious bodily injury constitute decided handicaps.

6. Minor injuries and the loss of several fingers are practically negligible handicaps.

7. Shoe machinery is standardized. The main processes are fixed and demand workers who are vigorous, active, and capable of endurance.

8. Shoe machinery is based upon thousands of costly patents and represents millions of dollars in investments. Changes for any one particular class of workers are likely to come slowly.

9. Handicapped men should be well trained and placed on shoe processes where they will be 100 per cent efficient as compared to other operators. They can expect to remain in the shoe factory permanently only on this basis.

CHAPTER XIV TRAINING IN THE SHOE INDUSTRY

Schools and Courses for Shoemaking. In several large shoe centers private schools for shoe workers have .been established. The work upon which operators learn usually consists of low grade shoes made by the school for factories, on a contract basis, or upon shoes manufactured from materials of second quality, bought at a low price from supply factories or from shoe factories. Persons wishing to learn a process of shoemaking are taken on rather as helpers at first in that process, giving their time and paying a fixed tuition, such as thirty or sixty or eighty dollars, without special regard to the time required for learning. The time spent in learning, however, may run from one to seven or

eight months. Operators run the same machines, though sometimes second hand, as are used in the shoe factory, and generally become capable of entering factories as fairly efficient workers.

A few towns and cities, in co-operation with shoe and leather manufacturers, have established courses in shoe and leather subjects in the public school system. These courses, however, are mainly at-

tended by persons already working in factories and leather houses and seeking additional training to increase their efficiency and earning capacity.

The instructors are superintendents and experts in the trade who have been given special training for teaching. The establishment of such courses marks a great advance in the shoe and leather industries.

Superintendents and foremen sometimes conduct classes at the factory for employees under them.

Quotation from a Report upon Industrial Education in Shoe Manufacture. The report of the Committee on Industrial Education of the National Boot and Shoe Manufacturers' Association, at the annual convention of the association in New York on January 13, 1915, contains the following:

" The subject of industrial education in the shoe manufacturing industry, which was referred to the undersigned Committee, is in our opinion a matter of great importance to our trade —■ so important indeed that, disturbed by the prevailing business conditions, in common with the other manufacturers in our country, we have been unable to give to it the careful investigation that it deserves. This report, therefore, may be considered as merely one of progress, designed to lead to a broader investigation of the subject later.

" That there is need of higher efficiency, based on a broader knowledge of, and a greater enthusiasm for, the work in which they are engaged on the part of the em-

ployees in our American shoe factories, and especially the young beginners in the industry, is sufficiently obvious to require no argument.

" This same need has been recognized in many other manufacturing industries, not only in this country, but in many foreign countries, and in the case of several of the latter notable progress has been made during the last ten or fifteen years.

" We therefore find that not only is industrial education of various grades being generally carried out in the older countries, like England, France, Germany, Belgium, Holland, Switzerland, and Denmark, but that even the great Orient

countries, just now awakening from their centuries of conservatism, and incidentally opening up encouraging vistas of future trade opportunities for our United States manufacturers — China, Japan, and India-—are also seriously taking up this question of higher efficiency in industry. Canada, one of the most progressive of the world's countries, has established a National Commission for the investigation of this question, and its report will be awaited with much interest by the friends of modern education.

" The more active campaign along this line in the United States has extended over the last ten years, and already has brought forth some valuable results. At the present time the National Society for the Promotion of Industrial Education is making an exhaustive national survey of the field, somewhat similar to that undertaken by Canada; and naturally the conclusions that may be reached by this organization will have a far-reaching influence on the future of industrial education.

" In so far as our American shoe industry is concerned we find that some excellent preliminary work already has

been accomplished by one of our leading organizations, the New England Shoe and Leather Association.

" This Association had the merits of the German and English

system of continuation, or part-time, industrial instruction brought to its attention by representatives of the Boston School Committee, and arranged to co-operate with that Committee in the establishment in 1910 of what we understand was the first shoe and leather continuation school in the United States.

" The first class brought together numbered thirty-nine pupils, representing twenty-nine different concerns in various branches of the allied shoe and leather trade, mainly boys and young men between the ages of fifteen and twenty, employed in offices, warehouses, and manufacturing departments, etc., of the shoe factories, tanneries, and other establishments. Since that time, there have been graduated from this school more than two hundred pupils, each of whom has received an official certificate of his technical ability, and in this way there has been laid a splendid foundation for the larger scheme of industrial education that is now being considered by the Association.

" The working method of this Boston Shoe and Leather Continuation School Class, briefly, is the holding of a series of two-hour sessions on two afternoons a week, covering a period of twelve weeks.

" The School Committee provides the classroom and the instructor, who, of course, has specialized in this particular branch of industry; and the Association and the trade it represents co-operates by furnishing competent lecturers,

and other experts, who from time to time give the pupils formal or informal talks on the subjects in which they are experts.

" Incidentally various trips of inspection are made to nearby shoe factories, tanneries, and other plants, the result being that the boys not only acquire a broad idea of the fundamentals of tanning and shoemaking, together with its ramifications of foreign-trade extension, advertising and general efficiency, but, what perhaps is as important as anything, they graduate with an interest and enthusiasm for their chosen vocation that will mean more than half the battle for them in their future life.

" This lack of real interest on the part of so many young beginners in our industry, which springs largely from the existing narrow vision of their work that lies before them, in any one department of it, is one of the greatest handicaps to both the youths and to the manufacturer who employs them; and if the continuation school did nothing more than inspire them with a real interest in what they are doing day by day for a livelihood, it would well repay all that it costs.

" There is no charge for tuition in the Boston Shoe and Leather Continuation School, except that non-resident pupils are charged a nominal fee, so that the only expense entailed is the four hours or so per week of the pupils' time that the employer donates to the good cause.

" In conclusion your committee would strongly recommend:

" First. — The establishment of shoe and leather continuation schools, similar to the Boston School, in every shoe manufacturing city and town in the United States that is in a position to support one, in this way possibly laying a foundation for a broader scheme of industrial education in the trade.

" Second. — That the National Boot and Shoe Manu-

facturers' Association establish a Standing Committee on Industrial Education to make a careful survey of the question and report to each annual meeting; and

" Third. — That the Association co-operate in every feasible way with the National Society for the Promotion of Industrial Education."

The existence of war conditions has prevented a country-wide adoption of the recommendations of this report, but herewith are presented accounts of the most notable developments in training for the shoe industry.

The Shoe and Leather Course of the Boston Continuation School. Following is a statement of the Shoe and Leather Course of the Boston Continuation School, recently prepared for the author by Mr. Owen D. Evans, formerly Principal of

the school:

In 1910 with the co-operation of the New England Shoe and Leather Association the Boston Continuation School started a voluntary short unit course on the shoe and leather industry. Since that time the course has been given once or twice each winter. To date a total of over 300 men in the shoe and leather industry have successfully completed the work. The men who take the course range from eighteen to twenty-five years of age; most of them are high school or college graduates. Their work lies on the distributing side of the industry rather than in production. The sessions are two hours each, twice a week during working hours for twelve weeks. A small tuition fee is charged for persons not residents of Boston. Usually the employer pays the

tuition fee. The work consists of lectures, demonstrations, class discussions, varied by frequent trips of investigation and inspection to tanneries, stock rooms and factories.

The detail of the typical twelve weeks' course is indicated by the following schedule for 1918, in which lectures are given by the instructor unless otherwise specified:

1. Brief historical account of leather making. Trade centers in the United States. Sources of hides and skins. Methods of curing.

2. Classification of hides and skins according to age,

sources, injuries, and " take-off."

3. Discussion of hide reports in trade papers to bring out above points. Merchandising of hides and skins. Chemical and anatomical structure of skin as applied to unhairing, fleshing, and liming.

4. Trip to New England Dressed Meat and Wool Co., Somerville. Killing of cattle and sheep. Care of hides in hide basement. Scouring and painting of sheepskins. Wool pulling and making of pickled sheepskins.

5. General outline of tanning operations from start to finish. Layout of tannery.

6. Chemical demonstration of action of tanning materials on hide-substance. Details of vegetable tanning and study of vegetable tanning materials.

7. Mineral tannages, chrome, alum, and combinations. Oil tannage. Details and processes.

8. Trip to the Beggs and Cobb plant at Winchester. An afternoon spent in seeing what has been taught. Principally chrome work.

9. Finishing operations. Patent leather. Preparation of varnishes.

10. Trip to American Hide and Leather Co., Woburn Highlands, including a brief visit to the Beggs and Cobb patent leather shop.

n. Lecture, Tannage of goatskins, also manufacture of sole leather.

12. Trip to Benz Kid Co., Lynn.

13. Talk on South America by Mr. H. G. Brock, Special Agent of the United States Bureau of Foreign and Domestic Commerce.

14. Tannage of Sheepskins and Calfskins, also a half-hour talk on the Far East by Mr. Clarence E. Bosworth, Special Agent of the United States Bureau of Foreign and Domestic Commerce.

15. Talk on Sheepskins and exhibition of stock by Mr. L. Y. Stiles at the Sheepskin Department of the A. C. Lawrence Co.

16. Brief outline of history of shoemaking in the United States. Development of machinery and the modern factory. Steps in manufacture up to stitching room.

17. Leather remnants, examination of stock at the C. G. Flynn Co., and talk by Mr. Battey on uses of various kinds of remnants.

18. Illustrated lecture on history of shoes by Mr. Wm.

F. Hall of the Publicity Department of the United Shoe Machinery Corporation.

19. Talk and exhibition of calfskins at Calfskin Department of the A. C. Lawrence Co. Talks on "Tanning," by Mr. L. F. Peabody; " Selling the Product," by Mr.

G. N. Bankhardt.

20. Trip to Stetson Shoe Factory, South Weymouth. High grade men's welts.

Rubber Heels by Mr. William Noll of the Foster Rubber Co.

22. Shoe Findings, Talk and Exhibit by Mr. S. R. Nichols of the Frank W. Whitcher Co.

23. Trip to the Thomas G. Plant Co., Jamaica Plain. Women's welts, McKay's, and turns.

24. Brief summary of shoe manufacture by the instructor. Remarks by Secretary Anderson of the N. E. Shoe and Leather Association. Presentation of certificates by Principal Owen D. Evans of the Boston Continuation School.

The Boston Continuation School conducts classes in several local shoe factories, which are of the nature of part time education. In these courses boys and girls from fourteen to

sixteen years of age are taught subjects related to shoe manufacture, and Americanization, citizenship, and hygiene. The teaching of factory processes is at present left to the factory itself.

The Lynn Independent Industrial Shoemaking School. The circular of this new school gives the following information:

This is a school conducted jointly by the Commonwealth of Massachusetts and the City of Lynn, under the provisions of Chapter 174, of the Special Acts of 1916, and aims:

First — To prepare the pupils for the shoe industry by methods impossible to use in other than a properly equipped vocational school.

Second — To so instruct the boys and girls of Lynn as to enable them to acquire a skill in and technical knowledge of the shoe industry which will enable them to enter that industry advantageously and rise to the highest positions of responsibility.

Third — While receiving instruction in the technical knowledge and necessary manipulative skill, the pupils are also to be taught the duties of citizenship; their obligations to the City, State and Nation.

Fourth — To meet the pressing needs of the shoe industry

both from a standpoint of the shoe workers and manufacturer.

Subject to the statutory requirements the school will be open to residents of Lynn over 14 years of age, with a Grammar School education who are able to satisfy those in charge of the school of their ability to undertake a four-year course. Membership will be limited to those who are willing to bind themselves so far as they are allowed by the laws of the Commonwealth to take the entire course if they are admitted.

Pupils may enter the school at any time during the school year and will be retained if, within a reasonable time, they show ability to profit by the training.

Promotion from one phase of the work to another will depend wholly upon the individual ability of the pupil.

There will be no promotion by classes and probably no fixed time for promotion, but the general schedule of studies found herein will be adhered to as closely as possible.

Interested candidates should address themselves to Michael J. Tracey, Director, 235 Euclid Avenue, Lynn, Telephone 5562.

This school offers a four years' course for boys and a

two years' course for girls. Each school year is one of forty-eight weeks, five days a week, seven hours a day. At least

50% of the time will be spent by the pupils in actual work in the school shops.

The school will be divided into the following departments:

Cutting Making and Finishing

Fitting Lasting

Sole Leather Packing and Office

The course of instruction is intended to give the students a thorough knowledge of the shoe industry and so far as possible to fit them for positions as shoe factory executives.

It is not thought that it can replace practical experience in the shoe trade. This will probably always be necessary for one desiring to become an expert workman on any particular part. The school does not intend to engage in the work of turning out merely expert cutters, lasters, edgemakers, etc., but does hope to give its graduates a broad training upon the fundamental principles of shoemaking which, coupled with a manipulative training and supplemented by experience, will enable them to understand and direct the technique of the making of shoes in all departments.

COURSE OF STUDY —BOYS

4 years — 48 weeks each year

5 days a week — 7 hours a day

Upper Leather Cutting Department Twenty-jour Weeks

Fifty per cent of the time to be spent in the school shop in actual work:

TRAINING IN THE SHOE INDUSTRY 317

Trimming cutting, including lace stays, top facing, back

stays, tongues and tips, knife and block cuttings .... 2 weeks

Linings 2 weeks

Outsides, hand and machine 8 weeks

Stock sorting 4 weeks

Pattern drafting, pattern making, and last measurements 6 weeks

Skiving 2 weeks

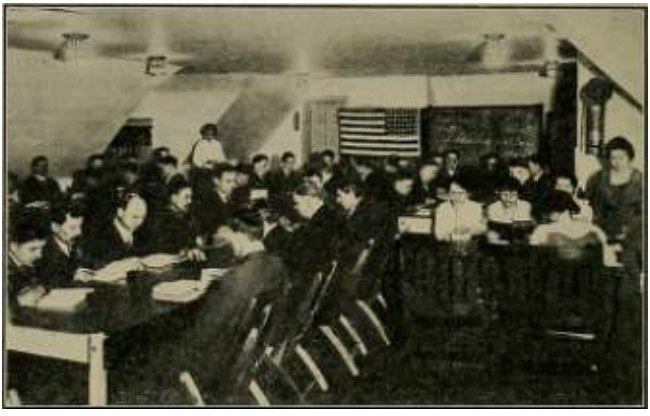
Twenty per cent of the time to be spent in the school room on directly related technical work arising during the course as applied to the cutting of shoes; such as the inspection and choice of skins and their use in different types of shoes, developing the ability to measure skins by the eye, the relation of the cutting department to the other departments

and the necessity of having the shoes exactly cut. The possibility of economizing in the making of shoes by "a properly conducted cutting department, the importance of reading the tags carefully and what mistakes may lead to; the importance of keeping a smooth surface on the cutting boards and how to obtain the same, the care of the cutting knife and the right kind of a " grind," the selection of the right parts to be used for trimmings, the selection of fabrics for linings and the importance of the lining to the making of a shoe, the selection of fabrics to be used in the outsides, instructions in the " feel " of leather, tanning and currying of hides.

Fifteen per cent of the time to be spent in the school room on-— -General Vocational Subjects: Designing shoes. Applied Science, as chemistry of tanning, etc. Applied Arithmetic. Industrial and Commercial Geography. Industrial History.

Fifteen per cent of the time to be spent in the school room on — General Non-Vocational Subjects: English, Mathematics, Citizenship, Hygiene, Recreation.

THE SHOE INDUSTRY



The Class of New Americans, all Endicott Johnson workers, studying that they may become citizens

Upper Leather Fitting Department Forty-eight Weeks

Fifty per cent of the time to be spent in the school shop in actual work.

Lining making and stamping 4 weeks

Closing and staying 2 weeks

Perforating, cementing and pressing 4 weeks

Back stays, tip stitching, fancy stitching and binding,

single needle work 6 weeks

Foxings 4 weeks

Top stitching, closing on, turning and blacking 6 weeks

Button hole operating, finishing, button sewing,

eyeleting 8 weeks

Vamping 8 weeks

Barring and toe closing 2 weeks

Table Work ■— including lining in, marking buttons and button holes, lacing and buttoning, blacking edges, inspecting, tying up and packing, and simple machine

repairs 4 weeks

TRAINING IN THE SHOE INDUSTRY 319

Twenty per cent of the time to be spent in the school room on directly related technical work arising during this course; such as, instructions as to the importance of good fitting in the production of shoes, of using the correct needles and threads on different parts of shoes and grades of work, instruction as to the proper allowances for seams on the different operations, the relation of pattern drafting and making to the fitting department, the possibility of designing new shoes by simply changing some of the parts in the fitting room, the different machines to be used on the different parts and how to secure the best results from them, also care for the same, the relation of the fitting of the shoe to the lasting

department, cutting department.

Fifteen per cent of the time to be spent in the school room on — General Vocational Subjects: Applied English. Applied Mathematics. Applied Mechanics. Applied Science. Drawings and Design. Industrial and Commercial Geography. Industrial History.

Fifteen per cent of the time to be spent in the school room on — General Non-Vocational Subjects: English, Mathematics, Citizenship, Hygiene, Recreation.

Sole Leather Department Twenty-jour Weeks

Fifty per cent of the time to be spent in the school shop in actual Work.

Rounding and cutting soles 2 weeks

Cutting inner soles 2 weeks

Channeling 4 weeks

Rolling and splitting 1 week

Turning channels i week

Molding soles i week

Making inner soles 6 weeks

Bench work 2 weeks

Sorting soles for size, weight and quality 4 weeks

Twenty per cent of the time to be spent in the school room on directly related technical work arising during the course; kinds of hides which may be made into sole leather, the parts of hides which may be used as soles, inner soles, counters, top lifts, taps, etc. Effect of water and heat upon leather, the different tannages of sole leather with especial reference to the oak, hemlock, union and chrome tannages.

Which shoes should carry a heavy sole, light sole. The process of tempering leather. Where branded leather may be used. How to practice economy in the cutting of leather and how to best utilize the different parts. The importance of careful sorting as to sizes and grades. Stains and how to remove them.

Fifteen per cent of the time to be spent in the school room on — General Vocational Subjects: Applied English. Applied Mathematics. Applied Mechanics. Applied Science. Industrial and Commercial Geography. Industrial History.

Fifteen per cent of the time to be spent in the school room on — General Non-Vocational Subjects: English, Mathematics, Citizenship, Hygiene, Recreation.

Lasting Department Twenty-four Weeks

Fifty per cent of the time to be spent in the school shop in actual work.

TRAINING IN THE SHOE INDUSTRY 321

Welts and McKays.

Welts; Assembling, hand pulling and hand lasting .... 8 weeks

Pulling over machine 4 weeks

C. H. M. machine 4 weeks

Bed machine 2 weeks

McKays; Pulling over machine 2 weeks

C. H. M. machine 4 weeks

Twenty per cent of the time to be spent in the school room on directly related technical work; such as the relation of lasting to the wearing of the shoe, with the especial reference to the possibility of the shoe losing its shape by wear. The importance of distinguishing between " yanking " and " pulling " when lasting leather shoes. The importance of reading tags carefully. Why lasters should know the difference between the different kinds of upper leathers. The necessity of careful work in guarding the " lines " when lasting shoes.

Lasting and its relation to the other departments.

Fifteen per cent of the time to be spent in the school room on — General Vocational Subjects: Specialized work on topics from Industrial Economics. Industrial History. Industrial and Commercial Geography. Industrial English. Industrial Design. Relation of shop, office and customers. Relations of employers and employees. Shoe literature. Factory Organization. Department arrangements and management. Placing machinery. Accounting in shoe manufacturing. Salesmanship.

Fifteen per cent of the time to be spent in the school room on — General Non-Vocational Subjects: English, Mathematics, Citizenship, Hygiene, Recreation, Business Methods and Forms.

Making and Finishing Departments

Forty-eight Weeks

Fifty per cent of the time to be spent in the school shop in actual work.

Welting 6 weeks

Rounding 4 weeks

Goodyear stitching 6 weeks

Bottom filling, welt beating, inseam trimming, tack pulling, and setting, leveling heel seat, nailing and

fudge wheeling 6 weeks

McKay sewing and leveling 4 weeks

Nailing 3 weeks

Shaving 4 weeks

Scouring, breasting and slugging 2 weeks

Edge trimming and jointing 5 weeks

Edge blacking and setting 4 weeks

Buffing and Naumkeaging 2 weeks

Rolling and finishing bottoms and heels 2 weeks

Twenty per cent of the time to be spent in the school room on directly related technical work; such as the difference between the welt and McKay process and the especial value of each. The importance of welting in reference to the fit and wear of the shoe. The importance of Goodyear and McKay stitching. The importance of a well finished heel and bottom. The importance of the heel and its application. Some of the results of badly fitted heels. What edge trimming does to the appearance of the shoe. The importance of having edges

properly " set."

Fifteen per cent of the time to be spent in the school room on — General Vocational Subjects: — Specialized work on topics from Industrial Economics — Industrial History. Industrial and Commercial Geography. Industrial English. Industrial

Design. Relation of shop, office and customers. Relations of employers and employees. Shoe literature. Factory, organization. Departmental arrangements and management. Placing machinery. Accounting in shoe manufacturing. Salesmanship.

Fifteen per cent of the time to be spent in the school room on — General Non-Vocational Subjects: English, Mathematics, Citizenship, Hygiene, Recreation, Business Methods and Forms.

Packing and Shipping Department

Tiventy-four Weeks

Fifty per cent of the time to be spent in the school shop in actual work.

Cleaning and ironing 2 weeks

Tip fixing 2 weeks

Lacing, buttoning, stamping, lining 2 weeks

Inspecting, shipping and routing 2 weeks

General Review 16 weeks

Twenty per cent of the time to be spent in the school room on directly related technical work; such as the cost of careless work in the packing room as compared with other departments. The artistic side of tip fixing and other repair work. Instructions as to the large shoe centers of this and other countries. The names of the large shoe manufacturers of the nation and their location. The large leather centers and names of the manufacturers. What labor costs include.

Office work including a thorough course in the day sheet system.

Fifteen per cent of the time to be spent in the school room on — General Vocational Subjects:

— Specialized work on topics from Industrial Economics— Industrial History. Industrial and Commercial Geography. Industrial English. Industrial Design. Relation of shop, office and customers. Relations of employers and employees. Shoe literature. Factory organization. Departmental arrangements and management. Placing machinery. Accounting in shoe manufacturing. Salesmanship. Law of Sales. Supervision and

Management.

Fifteen per cent of the time to be spent in the school room on — General Non-Vocational Subjects: English, Mathematics, Citizenship, Hygiene, Recreation, Business Methods and Forms.

COURSE OF STUDY —GIRLS

2 years — 48 weeks each year 5 days a week — 7 hours a day

Upper Leather Fitting Department

Forty-eight Weeks

Fifty per cent of the time to be spent in the school shop in actual work.

Lining making and stamping 4 weeks

Closing and staying 2 weeks

Perforating, cementing and pressing 4 weeks

Back stays, tip stitching, fancy stitching and binding,

single needle work 6 weeks

Foxings 4 weeks

Top stitching, closing on, turning and blacking 6 weeks

Button hole operating, finishing, button sewing,

eyeleting :... 8 weeks

Vamping 8 weeks

Barring and toe closing 2 weeks

Table work, including lining in, marking buttons and button holes, lacing and buttoning, blacking edges, inspecting, tying up and packing, and simple machine

repairs 4 weeks

Twenty per cent of the time to be spent in the school room on directly related technical work arising during this course; such as instruction as to the importance of good fitting in the production of shoes, of using correct needles and threads on different parts of shoes and grades of work; instructions as to the proper allowances for seams on the different operations; the relation of pattern drafting and making to the fitting department, the possibility of designing new shoes by simply changing some of the parts in the fitting room, the different machines to be used on the different parts and how to secure the best results from them, also care for the same, the relation of the fitting of the shoe to the lasting department,

cutting department.

Fifteen per cent of the time to be spent in the school room on — General Vocational Subjects: Applied English. Applied Mathematics. Applied Mechanics. Applied Science. Drawing and Design. Industrial and Commercial Geography, Industrial History.

Fifteen per cent of the time to be spent in the school room on — General Non-Vocational Subjects: English, Mathematics, Citzenship, Hygiene, Recreation.

Fitting, Packing, and Office Departments

Forty-eight Weeks

Fifty per cent of the time to be spent in the school shop in actual work.

Drafting and making patterns 4 weeks

Skiving 4 weeks

Cleaning and ironing 2 weeks

Tip fixing 2 weeks

Lacing, buttoning, stamping, lining in 2 weeks

Inspecting, shipping and routing 2 weeks

General Review 8 weeks

Office Work — including the actual work of conducting the work of the office, keeping of the books, and a full course of instruction in the sheet system 24 weeks

Twenty per cent of the time to be spent in the school room on directly related technical work arising during the course; such as the importance of correct measurements when measuring for patterns, the allowances to be made on the different patterns, the relation of the pattern departments to the other departments. The cost of careless work in the packing room as compared with the other departments. The artistic side of tip fixing and other repair work. Instructions as to the large shoe manufacturers of the nation and their location. The large leather centers and names of the manufacturers. How to determine costs. What overhead expense is. What labor costs include.

Fifteen per cent of the time to be spent in the school room on — General Vocational Subjects: — Specialized work on topics from Industrial Economics — Industrial History. Industrial and Commercial Geography. Industrial English. Industrial Design. Relation of shop, office and customers. Relations of employers and employees. Shoe literature. Factory organization. Departmental arrangements and management. Placing machinery. Accounting in shoe manufacturing. Salesmanship. Law of Sales. Supervision and Management.

Fifteen per cent of the time to be spent in the school room on — General Non-Vocational Subjects: English, Mathematics, Citizenship, Hygiene, Recreation, Business Methods and Forms.

TRAINING IN THE SHOE INDUSTRY 327

The Plan of the United States Training Service. 1 The Training Service of the United States Department of Labor, after a study of several months in shoe manufacturing establishments, has recently presented an elaborate program for the training of employees in the factory itself. This program outlines alternative methods for setting up instruction in the industry, adaptable to the different needs and facilities of shoe factories. The following excerpts are made from this bulletin:

Purpose of Training Program

Conditions in Shoe Industry. According to present conditions, factory training should deal with improving the ability of workmen already employed, the training of new help to meet the needs of factory changes and openings brought about through labor turnover. Conditions in the shoe industry warrant training in all these directions. The shoe trade consists of a number of highly specialized branches of such a type that the workmen, besides being machine operators, are called upon to do considerable hand work of a kind that tends to characterize the various branches of the

industry as separate trades in themselves. Such a variety of machines is used and so many operations are carried on that the training itself can be conducted quite inexpensively.

1 Training in the Shoe Industry. Training Bulletin No. 21. United States Department of Labor, Washington, D. C, iqiq.

The success of a teaching plan in shoemaking necessitates that it be outlined with the same care and good judgment that is so evident in the various manufacturing processes of this industry. Training factory help by " any old plan " in " any old way " has been a failure principally because it had neither aim nor method.

Testing New Applicants. All new applicants for factory positions, whether they claim previous experience or not, should be thoroughly tested and tried out before assigning them to the different branches of work in the factory. This testing can best be handled in the training room where the applicants can be tried according to the standards and requirements of the department in which they are to work.

Training New Help. New employees needing training should also be sent to the training room for instruction in the branch of work for which they have been employed. The training should be given upon production work up to the factory standards and requirements using regular factory equipment and materials. As soon as the learner has acquired the desired degree of efficiency he should be transferred to the

proper department.

Upgrading Employees. The shoe trades are especially suited for upgrading. This may take the form of improving the ability of workers who are

below standard, or it may have to do with training for promotion. The opportunities offered in this particular field make this an important feature in any training program.

Types of Training Suitable. In making any plans for training in a shoe factory, the instructor in charge should first make a careful and complete survey of his factory seeking out such information as will be of most aid to him in organizing and developing a plan. The types of operations performed in the shoe factory make it practical to train employees both in the separate training department and upon the factory floor. The greater part of the instruction, however, should be given in the separate training department. Modern equipment for this purpose should be installed. This can usually be transferred to the training room from the production floor or additional equipment purchased. When this equipment has served its purpose, it can be absorbed in the regular production work without interfering with any factory schedule.

Training According to Factory Requirements. The field to be covered by the training department will, of course, be

determined by the needs of the factory. This should be carefully worked out by the instructor in charge, whether his plan has to do with the testing of the new applicants, the training of the unskilled, or the improving of those below standard.

The method of training should be entirely in accord with factory requirements and conducted according to shop standards. This necessitates that the training be upon production. There may, however, be some cases where scrap material or a suitable substitute can be used to advantage in breaking in new operators. If it is found advisable to do this, in order to accomplish the purpose of training, the instructor should give it his personal supervision in order that it be not carried to extreme. Best results, however, are obtained where those being trained are immediately assigned to production work. Related Instruction. Connected with the process of making shoes, additional instruction in related technical matter is needed to give the workman a more complete knowledge of what he is doing. What and how much related instruction may be given should be determined by the director of instruction, depending on the needs of the factory. Some of this technical instruction can very well be given while the workman is being trained on the operations to which he is assigned. Other cases may necessitate this instruction being given individually or possibly to a group and conducted apart from the operation itself. Among those points on which such instruction can be given are: Matters relating to the understanding of the company's policies;

safety and sanitary regulations; shop routine; knowledge

of time tickets and other records which the workman uses on his job. It may be necessary also to carry on instruction in matters relating to leather or the details connected with the construction and operation of machines. This, however, should be determined by each instructor, according to the needs in his particular factory.

Departmental Relations. In arranging his program for training the instructor in charge should make sure at the outset that the plan has the proper support of the management and that its purpose is well understood by all executives, particularly the factor}' foremen, superintendents, or other officials who must necessarily come in contact with its operation. The relations of the training department to the factory proper, also to the employment department and the welfare departments, should be clearly defined from the beginning.

Cooperation of Employees. Organized methods of training in the factories may sometimes excite unfavorable comment on the part of various employees. Where such occurs the director of training should use tact and judgment in dealing with the matter, endeavoring to forestall difficulty. It has always been found that when the real purpose of training has been made clear to all concerned opposition entirely disappears.

To assist in establishing real harmony, it may be

advisable that there be incorporated in the program a working committee to co-operate with the instructor in charge when needed, in properly arranging details or systematizing matters to carry out more effectively the purpose of the instruction plan in general.

The Instruction Staff

Requirements High for Director. The success of the training will depend very largely upon the instructor who has charge of it. This necessitates that considerable care be taken by the management in selecting a man to handle the job; and in turn that this man exercise every effort properly to qualify himself and measure up to the requirements, in order that best results may be obtained.

Qualifications. Experience has proved that systematic training in a shoe factory requires several instructors besides the director, depending upon the size of the factory and the number of people to be instructed. As a rule, no one instructor is able to perform all operations equally well and therefore is not qualified to give instruction in all branches. The training staff, however, should be headed by a man capable of bearing the responsibility of properly selecting the instructors best suited for the various branches. Knowledge of the job is quite essential in this form of training. The instructor

in charge should likewise be able to impart this knowledge to others. He must necessarily have a strong and agreeable personality, an understanding of human nature, and be able to lead and handle men. Equally important is his ability to analyze a job and determine what elements require teaching and how this teaching can best be performed. He must also be able to lay out in teachable form a plan of procedure to be followed while training workmen.

Trade Knowledge Essential for Instructors. Experience has proved that best results are obtained where the instructors are thorough mechanics. Ability to teach can very often be developed through special instruction either in evening schools or in special classes conducted by the director. Where this plan is not followed, and instruction is attempted by one possessing teaching ability but lacking in trade knowledge, unsatisfactory results will follow and the success of the training be handicapped. The instructor should be able to furnish the learner the best information. This can come only from one who is entirely familiar with its processes.

How to Proceed with Instruction

Instructor's Guide. Unless the instruction be given in some organized teaching order it will be difficult for the learner to grasp and apply it effec-

tively. This order of procedure is the instructor's guide; it should direct him how to proceed both when training new help and improving those already on the job. It should be arranged in such form as to accomplish the aim desired with the least effort on the part of the learner, and be interspersed with explanations and demonstrations. How this fits shoe manufacturing requirements can best be illustrated by referring to edge trimming, a typical operation.

Four Steps in Procedure. As in all other cases, the procedure to follow in giving this instruction should be divided into four steps: preparation, presentation, application, and supervision. This form, can also be the guide for the instructor to follow in laying out his plan for teaching other operations.

Preparation. The preparation in this particuar operation should have to do with adjusting the machine and the tools for the work to be done to make sure that they are in perfect running condition and to produce the correct shape of edge. In this it is quite essential that the instructor makes sure that the cutter is properly ground to produce a clean-cut edge.

This is very necessary, as there is nothing more discouraging to a learner than to have to " hang around " while his instructor is making adjustments and fumbling with the machine, losing both time

and patience. He should see that the sole to be trimmed is properly " mellowed," as good instruction can not be given upon a shoe which is not in proper condition. The rack of shoes should be placed in a convenient position so as not to interfere with the progress of the instruction. When this preparation step is not carefully planned the effect on the learner is quite serious, as it often leads him to misjudge the instructor and the impression sometimes sticks with him a long time.

Value of Illustrations. The instructor should have at hand a shoe with an edge correctly trimmed, and another shoe showing the condition of the sole before the operation is performed. By referring to these a brief explanation can be given, acquainting the learner with what is to be done. During this preparation the instructor might deem it advisable very briefly to question the learner regarding his previous experience in machine operating and so obtain information which may assist him in steps that follow.

Presentation. In the presentation, the instruction proper is taken up and the learner is taught how to perform the machine operation. During this the instructor should proceed in logical order from the first detail of the operation to the finish, explaining and illustrating each point that needs instruction, in order that the learner may thoroughly understand what is being done as well as how it is being done. The

instructor should recognize the value of questions and illustrations in this work. He should likewise be on his guard lest he do too much talking. It is the tendency of some instructors to tell about the operation or the machine on which it is done rather than to instruct. The instructor should show the operator how he should stand at his machine and how to hold the shoe. As the machine runs at high speed he must caution the learner as he explains and demonstrates where to begin the operation, and how he places the edge of the sole against the cutter, drawing the shoe toward him with an even and steady movement, while at the same time observing carefully that the trimmed outline conforms neatly to the shape of the last. In trimming the toe additional explanation will be needed in demonstrating how to hold the shoe as it is guided around the cutter. While giving this instruction the instructor should see that the learner is following him, pausing here and there to find out if the learner understands. In manipulating the shoe during this trimming operation the instructor should proceed slowly, so that the learner may be able closely to follow the demonstration.

Repeating the Demonstration. By questions the instructor should determine whether or not the learner is able to perform the operation as instructed. It will be necessary to repeat the operation on a

second pair, making more clear those special points which, through questions, are found not to be clearly in the mind of the learner, again calling attention to the care that must be exercised in giving an even and continuous drawing motion to the shoe as it is passed under the cutting tool. The care to be exercised in obtaining a true edge must be made clear to the learner. The number of times this operation should be performed before the learner is able to apply the instruction will be determined by whether or not the learner has acquired the desired information. Carefully planned questions should be worked out by the instructor to test his understanding of the operation. This operation may seem very simple to the instructor, but he must use judgment and patience in presenting it to one unfamiliar with it.

Application. When the instructor is satisfied that the learner has grasped the various points the learner should be assigned to the machine to perform the operation himself. In this step it will be necessary that the instructor assist the learner as he first applies the instruction. Doubt or fear on the learner's part may cause him to hesitate in his first attempt, but this can be readily overcome by encouragement from the instructor. The instructor will find an excellent opportunity to use his best teaching efforts, as it will be necessary for him to assist the learner from time to time and even correct him during this procedure.

Helpful Suggestions. By examining each edge as completed he will be able to give the operator the benefit of

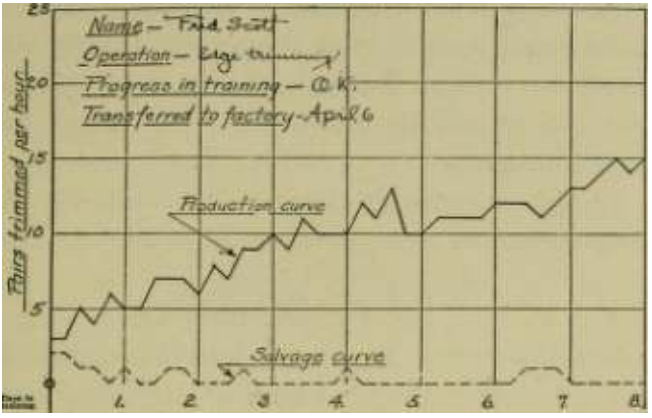
constructive criticism and offer suggestions for improvement on the next shoe. In this step much judgment will be required on the part of the instructor and he must exercise self-control, as quite often there may be a considerable tax on his patience.

The operator should not be hurried while applying the instruction, as that only tends to confuse him, and the value of the instruction is weakened. It is also well at this point to caution the instructor not to do too much " butting in," as interruptions of this sort distract the learner and indicate lack of teaching ability. These matters, however, the instructor should have in mind from the beginning and he should be prepared for emergencies. The instructor should anticipate the difficulties which a learner usually encounters.

Supervision. Supervision of the learner on edge trimming is absolutely necessary, for without it the instruction will soon lose its effect, and both spoiled work and poor working habits will result. The supervision should consist in carefully guiding the learner, correcting him from time to time as he continues to apply the instruction, in order to bring his work up to the highest standard. This necessitates that the instructor always be on the job and aid the learner when needed. Careful observation of

the operator as he works and an examination of the shoes as

trimmed will show the progress of the learner while in training. The best type of record for this purpose has been found to be of the chart form which follows:



2. 3 4-. &

Production Curve in Learning

What Record Shows. As shown, this records the progress of the learner during the time of his training. It shows how many pairs of shoes have been trimmed each hour and indicates when he has reached that stage of perfection which warrants his transfer to the factory proper. On this same chart is listed such spoilage as may be caused by the learner. This can be filed with the learner's application card after his transfer, as it furnishes evidence as to his employment and training.

Follow Up after Instruction. It is quite essential

after transfer to the factory that the learner be followed up for a short period to find out how he is progressing under production conditions. A graphic record will be of much value, as it shows the learner's progress compared with that of the training period. It should be followed up long enough to make sure that the operator is progressing as desired. Should there be an indication that he is not making good, he should be returned to the factory for further training.

In obtaining correct information for this record, the co-operation of the foreman will be needed.

Sole Leather Department

How to Proceed. In planning instruction covering the operations in the sole-leather department the instructor should proceed as previously outlined, listing the various steps in the operations in the proper order, noting those upon which special training is needed. In laying out these plans he should consider the best methods of handling the materials being worked upon, as well as the precautions to be observed by the learner in performing the operations. The machines to be used for instruction purposes should be in good running order and the tools so sharpened and adjusted as to give the best results. Before beginning the instruction the instructor should test out the machine, making several pieces

to be sure that everything is in proper order. These pieces can be used as samples of work, in illustrating the different points in the demonstrations that follow.

Elementary Branches — Channeling. Many of the operations in this department do not require a great deal of instruction planning and can be readily taught by a brief explanation or demonstration upon the job itself. The cutting of channels, however, may present a few difficult features from the training standpoint, as considerable instruction on these machines will be required, as well as close supervision of the learner after he has been assigned to apply the instruction. To illustrate how these machines should be studied in working out a plan for instruction there are herewith outlined procedures covering instruction on the Universal channeler welt machine and the Goodyear lip-turning machine.

In preparing the Universal channeler welt machine for instruction the instructor should first make such adjustments as are necessary properly to perform the operation. He should see that the machine cutting tool is in good condition and should try out the machine to make sure that it will turn out work up to the standards of the department. He should have on hand, arranged in best working order, the proper materials on which the instruction is to be given. By referring to the parts made as above mentioned, a brief explanation can be given as to

the purpose of this operation. Before beginning this instruction the instructor should see that the learner is in a position where he can both see the operation being performed and hear the explanation given.

Demonstration. The instructor should then proceed with the operation, explaining clearly as he demonstrates how the work should be fed into the machine with the right hand, and then grasped with the left hand, allowing the right to be free to operate the handle which changes the margin. In order that the learner may understand why it is necessary to make such a change the instructor should explain each step clearly as he performs the operation, showing the learner how and when to operate the handle as the work is fed into the machine. The reason for varying the margin to allow for the differences in thickness of the upper leather should be made clear. When working upon extremely pointed toes the instructor should explain that special precautions should be observed advising that two operators are here necessary to get best results. It should be clearly explained that in making the first operation, treadle No. 3 should be used in going around the toe, and that this causes the outside knife to be raised while the toe is being turned. The release of the treadle brings the knife again in operation, finishing the sole. The same procedure of instruction should

be followed in explaining how the toe is finished by

performing the second operation on the Goodyear channeler fitted with knife No. 6.

Preparatory to instruction on the Goodyear lip-turning machine the instructor should make sure that the machine is properly adjusted for the work and that the inner soles to be worked upon are tempered before the operation. In demonstrating how to operate the machine the instructor should see to it that the learner is in such a position that he can both hear the instruction and clearly see the demonstration. The parts to be worked upon should be properly arranged on the right side of the machine so that they can be conveniently fed into the machine. The left side should be clear to receive the work after the operation is finished. No explanation should be given as to the oiling or cleaning of the machine or the making of adjustments until demonstration of the operation is complete. During this demonstration the instructor should illustrate how judgment of the operator is required in assisting the machine when working upon soft inner soles. There may be a tendency toward grinding which might interfere with or widen the margin. As the operator is applying the instruction the instructor should be close at hand to assist him in difficulties that may arise where the grain of the inner sole changes from hard to soft, or vice versa, or where

it becomes necessary to adjust the table for the thickness of the inner sole in order that they may be properly fed. The operator should be cautioned that whenever adjustments are

made the belt should run on the loose pulley.

Outline for Instructor's Use. The following processes in the sole-leather department are listed to assist the instructor in charge in arranging a suitable plan for training for this particular department.

Sole Leather Department

An analysis of operations in manufacturing order.

Fitting sole stock, i. Tempering leather.

(a) Preparation of liquid.

(b) Distribution of liquid.

(c) Covering up.

(d) Proper length of time.

Note. — The tempering of leather demands special attention not because of its difficulty, but because of the important bearing it has upon future operations.

2. Rolling.

(a) Nature of the sole.

(b) Condition as to temper.

(c) Regulation of pressure.

3. Splitting.

(a) Condition as to temper.

(b) Weight of the sole.

(c) Weight of edge desired.

4. Sole extending (if used).

(a) Beveling sole and reinforcement.

(b) Attaching reinforcement.

5. Rounding.

(a) Quality of sole.

(b) Sizes to be cut.

(c) Adjustment of knife.

(d) Location of patterns.

6. Channeling. (McKay outer soles).

(a) Condition as to temper.

(b) Difference between single and tap sole.

(c) Adjustment of groove knife.

(d) Adjustment of channel knife.

Note. — This is by far the most important operation connected with the fitting of McKay outer soles. By the adjustment of the channel knife the operator determines whether or not the shoe to which the sole is attached will be capable of withstanding the amount of wear which the quality of leather warrants. The adjustment of the groove knife determines just where the McKay stitcher is supposed to lay his row of stitching. No attempt should be made to teach channeling until the operator has been grounded in other parts of sole leather work.

7. Feather edging and shank reducing.

8. Skiving taps and spring heels.

9. Cementing and trimming taps and spring heels,,

10. Turning channels.

(a) Condition of leather as to temper.

(b) Laying back the channel.

11. Stamping.

12. Molding.

(a) Condition of leather as to temper.

(b) Proper size of molds.

(c) Break at the shank.

13. Shank piece sticking (if any).

Inner Soles, Welts i. Rounding.

2. Channeling.

(a) Condition as to temper.

(b) Depth of channel cut.

(c) Width of shoulder, (i) In shank.

(2) On ball.

(3) On toe.

(d) Sharpening of knife.

(e) Adjustment of knife.

(/) Weight of between substance.

3. Making of Gem inner soles.

(a) Tempering.

(b) Weight of materials.

(c) Cutting and turning lip.

(d) Cementing cloth.

(e) Getting cloth into base of the rib. (/) Width of shoulder.

(1) In shank.

(2) At ball.

(3) Around toe.

4. Making Economy inner soles.

(a) Channeling.

(b) Shipping.

(c) Width of shoulder.

(1) In shank.

(2) On ball.

(3) Around toe.

(d) Turning lip.

(e) Sewing lip. (/) Tempering.

Note. — The making of a welt inner sole affects the very foundations of a shoe, for if the work is not properly done in the first instance, it can never be remedied, thereby vitally affecting the wearing quality as well as the appearance of the finished shoe. No attempt should be made to teach inner-sole channeling until the operator has been thoroughly grounded on other parts of the sole leather department.

The Retail Shoe Salesmen's Institute, Boston. This institute, the only one of its kind in the world, was organized in 1917, but began operations in 1920. Its founders comprise the leading dealers of the shoe trade throughout the country. While its purpose is to train retail shoe salesmen, the material and instruction provided by it deal with shoe manufacture in part, and would be helpful to all students of the industry. The school conducts local classes and gives extensive instruction by mail. Following are presented statements upon the course and service of the school:

The Retail Shoe Salesmen's Institute is a co-operative organization having for its purpose the systematic, scientific, careful, accurate and comprehensive education and training of retail shoe salesmen. It is founded and maintained to co-operate exclusively with retail shoe dealers and department buyers in training their salespeople; to place in the hands of

retail shoe dealers and managers an instrument of betterment in their selling department; to enable dealers and managers to secure a profit on the intelligence of their salespeople as well as on their physical effort.

Each subject is covered in a volume of about 200 pages

and 50,000 words, illustrated wherever illustrations will further enlighten, amplify and explain the text.

Each volume treats its particular subject thoroughly, accurately, practically in plain everyday, non-technical language always from the standpoint of the retail shoe salesman and his job.

Each volume is printed on good book paper and cloth-bound into a handsome book, about 5x8 inches — can be carried in coat pocket.

Considered as a whole the eight volumes cover the whole range of the retail salesman's duties providing a wealth of accurate information plus a good deal of inspirational material, certain to. fire the ambition and enthusiasm of any salesman and to bring out the best that is latent in his nature as a man and as a co-operating employee.

The Training of Disabled Soldiers In the Shoe Industry in Foreign Countries. Shoemaking is one of the most popular trades that have been taught disabled soldiers and sailors, in

the course of and after the war, in Canada and across the sea. It has, however, taken the form of shoe repairing and hand shoemaking in the main, with some little training in shoe factory processes. The reasons for the popularity of the trade are that the work is done seated and does not require very hard physical efforts, and that the trade can be carried on either in a workshop or at home, in the country as well as in the city. It does not require much initial expense to

start a small cobbler's shop, and the cobbler, even in the smallest village, is assured of a fair revenue in addition to his pension. The trade therefore strongly appeals to men affected with injuries of the lower limbs, particularly those of country origin who wish to return to their villages. The French National School of Agriculture, at Grignon, has, among its reeducation classes, one of shoemaking, as this is considered one of the possible " subsidiary " occupations for a small farmer. In some instances, training in shoemaking is combined with that in harness-making.

Training in shoemaking or shoe repairing has been carried on in Canada, in the military hospitals of Montreal, Halifax, Toronto, Saskatoon, and other places; in a number of technical schools, such as the Montreal College of Pharmacy, the Nova Scotia Technical School at Halifax, and Queen's University at Kingston, Ontario; and in numerous factory workshops, such as those of the Union Shoe Repair

Company, Toronto, the Wood Shoe Company, the Williams Shoe Company, and the Askew Shoe Company of Hamilton, Ontario.

Training in the industry has been given in England in the military and orthopedic hospitals, such as the Royal Pavilion Hospital, Brighton, the Convalescent Hospital, Roehampton, and many others; at technical colleges and institutes, such as the Brixton Poly-

technic Institute and the historic Cordwainers Technical College of London, and in shoe shops and factories throughout the country. In France similar training has been provided in the re-education schools of Paris and other towns and cities and in technical schools and workshops. The industry has been taught to disabled men in several Belgian schools and in a considerable number of Italian schools, as at Turin, Spezia, Pisa, and Milan. Germany has taught shoe-making to many of her returned soldiers in the workshops of the Army Clothing Department and in the hospitals and schools of many communities. Austria-Hungary, also, has given special attention to teaching the making and repairing of footwear in her re-education and trade schools.

The work done in all of these countries in various lines of re-education is of very great interest to America in her problems of reconstruction. We shall here, however, give space only to a short presentation of methods and

accomplishments in France and Great Britain.

A French official census, covering fifty-six reeducation schools, has shown that on June 30, 1916, of 2,846 disabled soldiers undergoing training there were 466 shoemakers, this being the largest single trade group. In the National School at St. Maurice, Paris, 152 men attended the shoemaking section during the first two years when the total

attendance of the school was 803; of the 152, there were 143 men with leg or foot injuries; 55 men were former peasants. In the school of the Rue du Epinettes, 60 men, out of a total of 150, were attending the shoemaking shop; 143 shoemakers had been placed by the school, up to June 1, 1917, out of a total of 340 graduates in all trades. Of these shoemakers almost all were suffering from leg injuries. Former peasants numbering 27, formed the largest preoccupational group. In the Lyons school, the first re-education school created in France, shoe-making at once proved the most popular trade. There were in this school, in the first year, 50 men in the shoemaking shop, of whom 29 were former peasants. At the Tourvielle branch of the Lyons schools on May 31, 1917, 60 shoemakers were graduated, out of a total of 129 men for all trades, of whom 34 were former peasants. Almost all of these were cases of lower limb injuries, 35 were cases of leg amputation, one man had both feet amputated, and two were legless.

Dr. Borne, the noted French authority, in his general re-education scheme, gives the duration of apprenticeship in shoemaking as from one year to one year and a half. In actual practice, however, both the duration and the methods of training vary from one school to another. The apprenticeship is generally intensive; after a short time, the student,

while at school, is able to do useful work; many of the schools are, therefore, in a position to fill outside orders and to be to a larger or less extent self-supporting. Thus, while in Nancy the apprenticeship is of six months, it lasts from twelve to fifteen months at the Montpellier School. At Bourges the apprenticeship is from four to six months for repair work, and from ten to twelve months for the making of new shoes. At the Saint-Maurice School the length of apprenticeship is, on the average, five months for repair work, and eight months for the making of new shoes. The course is divided into three sections of practical instruction. A month's training is allowed for plain machine stitching, seaming, welting and soleing. At the end of five months apprentices should be able to re-sole shoes, both pegged and hand-sewn. Complete shoes are made by men of average ability by the end of eight months. The men receive, in addition, theoretical instruction in branches essential to carrying on the trade, such as study of foot-forms, a knowledge of leathers, and the taking of measurements.

At Port-Villez the shoemaking shop is divided into two sections: repair work and the making of new shoes. During

the first two or three months, all students work at repairs; by the end of one week the apprentice is sometimes able to perform useful work. The majority, however, pass into the shoe-

making section. After five and one-half months, men who came from other trades are able to make perfectly good military boots. All the orthopedic boots for the Institute are made by the apprentices of the shoemaking shop.

At the Tourvielle School the apprenticeship is from ten to fifteen months. The apprentices are first taught to make their own shoemaker's stirrup and glove. In doing that they learn how to make a waxed thread and to use the awl. Next they are directed to assemble and sew by hand the parts of a pair of slippers, which they are allowed to keep for their own. Coarse brogans are their next problem and then fine boots. After a month's training, the student can feel that he is a shoemaker — he has made a pair of shoes for sale, with the help of the teacher of the course. After ten months or a year, he needs only some final lessons on cut and style, on the selection of material, on the way to obtain customers and on price fixing, to be able to get along by himself. If his physical condition permits, he can also have some practice with shoe machinery, which has been supplied to this school by the United Shoe Machinery Company of France.

In Great Britain both the making of hand-sewn shoes and the factory shoemaking trade have been included in the so-called " special trades," in which the training and employment of disabled men are of

considerable importance and require special regulations. These regulations have been worked out for each trade by a Trade Advisory Committee formed of representatives of employers' organizations and labor unions.

The report of the Trade Advisory Committee on the Hand-Sewn Boot and Shoemaking and Boot and Shoe Repairing distinguishes between two classes of disabled men: (i) Those unable to stand continuously at their work, and (2) those able to stand continuously. For the former, the report recommends training in all branches of hand boot and shoe repairing, and in riveting and finishing; for the latter, training in hand work is recommended as the best introduction to machine boot and shoe repairing, and also training in the use of machines used in the repairing trade, in view of the fact that a large amount of repairing is already done by machinery and that this method may possibly grow in the future.

The several processes suitable for the different types of disability are as follows:

(1) Hand-Sewn Boot and Shoemaking and (2) Hand Repairing. This work can be done sitting and would be quite suitable for a one-legged man. Full use of both hands and

arms is needed, but the loss of one or two fingers would not disqualify. Good eye-sight is required. Men suffering from shell-shock may in some cases be

likely to find this a suitable occupation. It is not recommended for men with a tendency to consumption.

(3) Machine Repairing which includes three processes: (a) Bench Work. This is done either standing or sitting, but in other respects the requirements are the same as for hand work, (b) Machine Stitching. It is standing work, and often a treadle has to be compressed by the right foot to start the machine and hold down during the operation. Both hands are required. The work is light and there would be only slight vibration, (c) Finishing by Machine. It is principally done standing, but the machine can be adjusted so as to be worked while sitting. Use of both arms and hands is required, but little or no movement of the leg or body. The work is not heavy, but it is not recommended for a man with a weak heart or a tendency to consumption.

The training is provided in technical schools or other training institutions, or in some cases in workshops. The duration of the training in a school is not to exceed twelve months, but in exceptional cases it may be completed by an additional six months' training under an approved instructor in a workshop. The period of training in a workshop is

eighteen months for shoemaking combined with shoe repairing, and twelve months for shoe repairing only.

The first month of training is, in all cases, a trial period. If at the end of this period the man proves unsuitable for the trade, his training ceases. The

employer is required to pay the apprentice a minimum wage, which, in the eighteen months' course, is fixed at 105. per week during the first six months, 155. during the next six months' and 20s. during the last six months.' In the twelve months' course, the employer shall pay no wages during the first six months, and shall pay 155. per week during the second six months.

One of the first technical schools to institute special classes for disabled soldiers in the making of hand-sewn shoes was the Cordwainers Technical College. The following classes are open:

1. High Grade Boot and Shoe Making. This course extends to at least twelve months and covers the following syllabus:

The making of men's and women's hand-sewn boots. The making of sew-rounds. How to take a measure of a customer's foot, and fit up lasts for the same. How to send a measure to the upper maker or manufacturer. The selection and purchase of bottom stock. How to cost the finished work. The anatomy of the foot.

2. High Grade Boot and Shoe Repairing. This course extends to at least six months and covers the following syllabus:

The methods of repairing men's and women's hand-sewn boots. The repairing of machine-welted boots. The repairing of sew-rounds, etc. Patches, blind stabbing, and other stitching. Grafting, costing materials and work.

TRAINING IN THE SHOE INDUSTRY 357

In factory boot and shoe manufacture, according to the Trade Advisory Committee, " as a result of the development and use of specialized machinery and tools, many of the processes are of a comparatively simple character, not calling for great physical exertion and suitable for the employment of disabled men of a fair degree of intelligence. The work is not heavy, but requires concentration and adaptability. The operations generally require the full use of hands and arms, but many operations would be suitable for a man with an artificial leg, provided he is able to stand at his work."

The report of the Committee indicates the following processes suitable for different types of disability:

1. Clicking Department. For pattern grading, hand clicking and power eyeleting, both hands and arms must be uninjured, but the operations would be possible for a man with an artificial leg. For the clicking press young men are required

whose hands, arms and legs are sound.

2. Rough Stuff Department. For the cutting press and roller, young men are required whose hands, arms and legs are sound; for grading machines and splitting machines the loss of a leg would not necessarily disqualify.

3. Preparation Department. For sole molders, out-sole, and in-sole channeling machines and power skiving the full use of hands, arms, and legs is required; work especially suitable for young men; a man with an artificial leg would not be debarred.

4. Making Department. For pulling-over machine, control tacking, pounding machine, Blake lining, standard

screwing, loose nailer, stitching machine, leveler, heel attaching machine, loose billing, universal slugger, welt sewer, sole layer and rough rounder, young men are required who are sound in both hands, arms, and legs. Hand tacking is also suitable for older men. Work at the rough rounder and welt sewer should be confined to men who have had some experience in the trade.

5. Finishing Department. Heel trimming, edge trimming, edge setting, and bottom scouring are suitable for men with an artificial leg, but both hands and arms must be uninjured. Heel scouring and heel burnishing require young and active men whose hands and arms are sound; an artificial leg would

not necessarily disqualify.

The course of training in any process shall be divided into a probationary period and an improver's period. The probationary period must as a general rule, be spent in a technical school, though in exceptional cases the Local War Pension Committee may permit the man to spend it in a factory. The improver's period shall in all cases be spent in a factory.

The length of training varies for the different processes. It ranges from twelve weeks for power eyeleting to fifty-two weeks for hand cutting.

During the training in a factory the employer shall pay the man a minimum wage, according to a graded scale prepared by the Trade Advisory Committee, and ranging from 10s. to 25s. a week.

While undergoing training in any trade, the dis-

abled soldier receives from the Ministry of Pensions the difference between his wages and the pension paid for total disability (275. 6d. per week for a private). His wife receives a separation allowance and a maintenance allowance for each child. The Ministry of Pensions assumes the payment of all tuition fees and other expenses entailed by

the training.

For every trade there have been created local Technical Advisory Committees, formed of representatives of employers' associations and labor unions, which select candidates for training, examine the suitability of the training offered in the technical schools or similar institutes or in the factories, and receive applications from employers for the supply of men after training.

The question of wages to be paid disabled men after training is to be settled entirely by the Local Technical Advisory Committee, or by Special Advisory Wage Boards which are being created by the Secretary of Labor in the principal towns.

CHAPTER XV

THE SHOE REPAIRING INDUSTRY

Shoe Repairing Now a Shop Industry. The individual shoe cobbler is still found in almost every community, but in recent years repairing has become a special branch of the great shoe industry. It is now a shop industry in itself. There are approximately 50,000 shoe repair shops in this country, with an annual business of more than $300,000,000. These range from the shop in which one man does handwork to the shops conducted by retail stores and the large independent shops which have machinery and employ a considerable

number of workers. Probably nearly 20,000 of these larger shops are fitted out with modern shoe machinery. Such machinery is manufactured especially for repair work and is simplified since it must sometimes be operated by unskilled workers or by workers who have not had experience in the shoe factory. Usually the machines are all set on one motor-drive shaft along one side of the shop, and comprise the lockstitch sole sewing machine, the leveler, trimmer, edge setter, and burnishing and polishing brushes. A shop may have several sets of machines on which

a team of men usually works. Such a shop may employ from twenty-five to thirty-five men and may repair from 60,000 to 70,000 pairs of shoes a year. A few shops employ as many as sixty or seventy men. A tag system is used resembling that of a

Shop of the Philadelphia Shoe Repairing Company, Philadelphia, Pa.

regular factory. In a small shop each worker may be capable of doing all the repair processes. In the large shop the work is subdivided. As many as seven, men, each doing a particular process, may work at the same time on the machines of the shaft. Some such concerns call for shoes at the homes of

customers and return them after making the necessary repairs. In many of the shops a shoe shining department is maintained, and nearly all of them sell shoe supplies.

Men Working at a Motor-Drive Set of Shoe Repairing

Machinery

A brief and comprehensive statement of this development is the following, from American Shoe-making for June 12, 1915:

" The industry of repairing shoes has grown swiftly in the last few years, and now is of such size that it may be recognized as a special branch of the great shoe industry."

" The main thing in the modern shoe repairing busi-

ness is to build up patronage. Salesmanship is as necessary to success in it as is good workmanship. Somebody must go out and convince customers that they should have their shoes re-soled, or otherwise repaired. This selling work may be carried on in big cities, small cities, in towns, or out in the country.

" In the business district of one large city some bootblacks put some repair machines in their back shop. One of them went among the offices of the neighborhood asking for shoes to be repaired. He offered to give tickets good for six free shines with every pair of shoes that he re-soled. By this means a repair business was built up among occupants of the offices sufficient to keep four men employed. Besides, the shoe shining business flourished.

" In the small cities and towns, the repair men send agents in autos, or on motorcycles, along the highways, to call at door after door and collect shoes to be repaired and returned. In some western communities the steam laundries have started shoe departments, and their wagons collect shoes to be shined or repaired, and to be returned with the regular basket of laundry.

" The rapid increase in the repair business has probably cut into the sale of new shoes. But it has opened a new field for enterprising men in the starting of repair shops, and in selling goods to repair shops."

Shoe Repairing Advanced by the War. There are now over eighty local organizations of shoe repairers in the United States, and the increasing cost of leather and footwear during the war and after has given a great impetus to the industry. An investigation into machine shoe repairing throughout the

country has recently been made by Mr. Frank W. Whitcher of Boston, some of the results of which may be summarized as follows: 1

1. Machine shoe repairing has supplanted hand repairing to the extent of eighty per cent in the Middle States

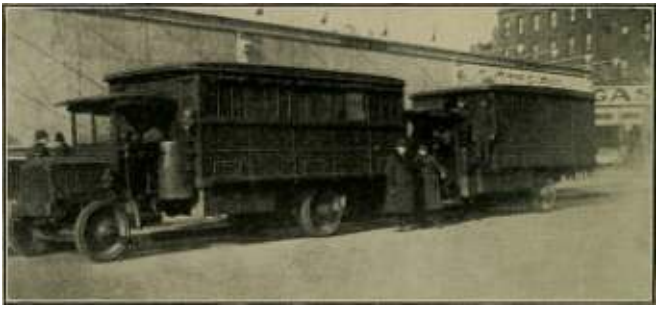


Photo by Central News Photo Service, New York.

New Auto Shoe Repair Trucks of the U. S. Army. Designed and equipped by the United Shoe Machinery Corporation of Beverly, Mass. One truck carries a full outfit of machinery, the other of supplies. By this system 800 pairs of shoes can be repaired daily.

and Northwest, fifty per cent in the Far West, seventy-five per cent in the South, and ninety per cent in the East.

2. The number of men employed varies from the boss and one to three or four men in shops having a single machine repair outfit to the city shop having several outfits and using from thirty-five to forty men.

3. The average shop repairs from twenty-five to forty pairs of shoes per day, or ten to twelve pairs for each man working.

1 See article on " $300,000,000 Spent for Shoe Repairs" in The Shoe Repairer and Dealer for August, 1917.

4. The business of the average shop amounts to $1 on each pair of shoes repaired, being from $25 to $40 a day or from $6,000 to $12,000 a year.

5. The yearly percentage of increase in repairing since the outbreak of the war has been from fifteen to forty per cent in the Middle States and Northwest, fifty per cent in the West and South, and from twenty-five to forty per cent in the East.

Learning Machine Shoe Repairing. The hand shoe repairer may easily learn machine shoe repairing. He may secure an equipment of machinery, hire helpers if necessary, and open a repair shop. Men of mechanical ability may be taken into the repair shop to learn both hand processes and machine operations. From these machine operations they may pass directly into corresponding work in the shoe factory. Less frequently, workers in the factory leave and open shops of their own.

Steps were taken during the war in several places to provide special training in shoe repairing, for returned soldiers and others, because of the scarcity of men for the repair shops. Plans were not fully formulated and the early closing of the war delayed them, but it may be stated that a well-known shoe machinery repairing company contemplated turning one of its local shops into a repairing school to be conducted under Government or other auspices for the benefit of the

entire industry.

Earnings in the Industry. In the small shop, employing few workers, and doing mostly hand repairing, the earnings may vary from two to five dollars or more a day. In the large shop, in which repair work is done mainly by machinery, the operator earns about the same as he would in the same processes in the shoe factory. Employment in repairing is fairly steady through the year in most communities, but it is somewhat reduced in the large town or city during the summer season.

Opportunities for Handicapped Men in Shoe Repairing. Disabled men may become individual shoe repairers even if having only one good hand and an efficient appliance for the other. Hand repairing is regularly done seated. At present machine repairing in done standing, but seats might easily be arranged at the machines as may be done in the shoe factory for women and disabled men. The handicapped man will not meet the difficulty of factory speed in the shoe repair shop, except at times in team work, so that he may enter it even if he is not capable of making a large daily output. One or more men who have physical handicaps and who are familiar with shoe work, or who may learn it in their industrial re-education, might successfully open a machine shoe repair shop in any community. Repairing machinery may be leased or purchased outright at comparatively low cost.

Action by the Trade Promotion Bureau. The Trade Promotion Bureau of the National Leather and Shoe Finders' Association, at St. Louis, has recently taken up the matter of the advancement of the shoe repairing industry. A letter from Mr.

Interior of the Shoe Repair Truck, U. S. Army

George A. Knapp, Secretary-Director of the Bureau, to the writer, is herewith reproduced:

I have your esteemed favor of November 8, and I want to thank yourself and Mr. Whitcher for giving me this opportunity of briefly laying before you the work which the Trade Promotion Bureau, of which I am Director, has undertaken. This Trade Promotion Bureau is supported by the members of the National Leather & Shoe Finders' Assn., which is comprised of manufactures, tanners and jobbers, who supply the materials used by the shoe repairers throughout the United States. We have felt for

a long time that the shoe repairing service which the public has been receiving is not of the proper caliber. We are convinced that shoe repairing is just as important to the public as other repair service, because when it is properly done it doubles the life of a shoe; and is, from this standpoint, of great economy to the public. Therefore, our Trade Promotion Bureau has, for the past nine months, been carrying on a propaganda that has for its ultimate object the

advancement of the shoe repairing industry. We have been striving during this time to impress upon the shoe repairers that good workmanship and good materials constitute a quality job of shoe,repairing and we have been trying to convince them that if they will give this kind of shoe repairing service to the public they will advance their interests and make shoe repairing a more popular service than it is today. We have also tried to get the shoe repairer to improve his business policies by introducing salesmanship, by making his shoe repair shop a supply depot, by keeping an account of his business and by advertising the service that he can render, in his neighborhood. In order to bring these suggestions to the shoe repairer in concrete form we have gotten up some advertising suggestions and we have sold over 200,000 of these to the shoe repairers at cost. We have also prepared an account book which we sell to the shoe repairer at 50 cents. This book is large enough to take care of two years' business, and hence costs the shoe repairer but two cents a month. We have issued several pamphlets and written a number of letters to the shoe repairer, urging these improvements in his business. At the present time I am preparing a pamphlet that will show the interested shoe repairer just how important his service

is to the public and that it should take its place in line with other neighborhood service.

I also wish to state that at the present time we are trying to interest the Trade and Manual Schools throughout the United States in adding shoe repairing courses so that the pupils in these schools may be taught the art of shoe repairing. We have done little along this line as yet, as I have been unable to obtain a list of these Trade Schools, but I now have assurance from the Government that they will furnish me a. list of these schools and as soon as I get this list I will take this matter up with each of these schools direct.

We know for a fad that shoe repairing is an honorable occupation and that it may be made a very remunerative one, and we believe that the time has come when shoe repairing will soon take its stand alongside of such service as the laundries, the clothes pressers, and other services which cater to the general public.

Crippled men can do this work just as well as men who have all their limbs. I believe that a man with one hand can do just as good shoe repairing as a man with two, and the loss of his lower limbs would not affect his efficiency at all. Of course, one would have to have good eyesight, as we are now using power machinery in shoe repairing and it would be dangerous to permit blind people to enter the industry.

CHAPTER XVI THE SHOE FINDINGS INDUSTRY

Shoe findings comprise all the parts used as accessories to boot and shoe manufacture, retail trade, and repair. Findings

accompany the shoe from its beginning until it is worn out by the consumer. Their importance increases with the growing magni tude of the shoe industry. They can be produced so much more cheaply, and in such quantities, in special, separate factories, that they now constitute individual small industries which supply the manufacturer, dealer, and repairer throughout the world. They represent the extreme of specialization in manufacture and trade. Some large shoe factories make a few of their findings, such as counters, toe boxes, and shanks, but the great bulk of such things come from special manufacturers.

Shoe Findings Manufacture in the United States. There were no findings manufactured in this country, on any scale of importance, until about ioo years ago, although shoe manufacture became a distinct American industry immediately after the Revolution. For forty or fifty years after the Revolution, as before, shoe manufacturers and dealers imported

their findings from European countries. The earliest date known for findings manufacture and business in the United States was 1826. A firm was established in Boston in that year by John Tillson. That firm still exists as the Frank W. Whitcher Company, whose head is regarded as the leading authority upon the findings industry in this country today. Few other firms, so far as is known, were established before

the Civil War period, when many appeared in the decade of the sixties through the impetus given to shoe manufacture by the war. Since that period findings factories have increased with great rapidity and frequent consolidations until there are now over 350 in the country, employing about 8,000 persons. There is also a National Leather and Shoe Finders Association, comprising 316 firms in 1918.

To show that the shoe findings industry is at present centered largely in Massachusetts, the following statement made expressly for this chapter by Mr. Frank W. Whitcher is added:

" While manufacturers in other sections of the country are increasing their production, Boston and its surrounding cities and towns supply at the present time 65 per cent of all of the boot and shoe findings manufactured in the country, furnish employment to 65 per cent of those engaged in the business, have 70 59/100 per cent of the capita] employed, and the value of their product is 67 1/5 per cent of the total output of Shoe Findings in the United States."

THE SHOE INDUSTRY

The European War has reduced findings manufacture, through a reduction in the number of styles, colors, and kinds of footwear and the elimination of buttons, bows, and ornaments.

The Chief Articles Included in Shoe Findings. The shoe findings now manufactured as separate industries include the following articles:

Linings

Webbings

Trimmings

Pipings

Cotton and paper

specialties Fillers Blacking Dressings Polishes French chalk Wax

Burnishing ink Shoe brushes Bindings Steel and

wooden shanks Counters Fibreboard Toe boxes Wooden, cork, and

rubber heels Shoe forms Arch supporters Metal protectors

Vamp stays

Rands

Straps

Beading

Leather and cloth bows and

ornaments Fancy buckles Eyelets Lacing hooks Lacings Buttons Button hooks Shoe horns Backstays Iron lasts Nails Tacks Pegs Sole leather parts for repairs,

such as soles, taps

and heel lifts Shoe thread Repairing tools, such as

knives, lap stone, shoe

hammers, awls, and needles

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Four Classes of Shoe Findings. Shoe findings may be divided into four general classes, as follows:

1. Shoe Manufacturer's Goods,

2. Shoe Store Supplies,

3. Leather and Findings for Shoe Repair,

4. Shoe Dressings and Polishes.

Shoe manufacturer's goods include all the findings, parts

used in the shoe factory, from cut stock and linings to dressings and polishes. These goods embrace most of the articles contained in the long list which precedes.

Shoe store supplies include the small articles usually sold by the shoe retailer, such as shoe forms, arch supports, lacings, dressings, and polishes. Dealers usually give away, for advertising purposes, such things as button hooks and shoe horns.

The articles used by the shoe repairer are in part the same as those used by the manufacturer, such as leather parts for bottoming, nails, pegs, threads, dressings, and polishes. They include also the tools of the repairing trade, as shown in the list. The hand repairer generally deals also in the supplies which are regularly carried by the retailer.

Dressings and polishes are not always classed separately, as they enter into the three other divisions so generally. Yet their manufacture is entirely separate, and they are of great importance both industrially and commercially.

Each Shoe Finding a Separate Industry. The manufacture of each kind of shoe findings, which altogether are approximately 50 in number, is in itself a small industry. The 350 factories of the country employ about 7,000 people at the present time, an average of 20 persons to a factory. Some factories, of course, employ more, as in the case of the manufacture of dressings and polishes in which there are

several establishments whose employees number from 100 to 200. Many factories, on the other hand, are little more than small shops, and give employment to but 5 or 8 or 10 persons.

Women in the Industry. Girls and women are largely employed in some branches of the findings industry, which consists of the manufacture of small, light articles that women can handle especially well. Many of the machines used are well suited to operation by women, or have been built especially for that purpose. The proportion of the sexes in the occupation varies from the making of iron lasts, for the shoe repairer, in the foundry employing men almost exclusively down to the making of shoe lacings which is as distinctly a woman's occupation. Altogether, however, women constitute only about one third of the wage earners of the industry.

The employees of the typical findings factory are divided about as shown in the following diagram:

The Division of Employees in the Typical Findings Factory

One

Foreman

Two or 3 Men expert in important processes or operators of

heavy machines

One Man or Boy for heavy unskilled work or for shipping

From 6 to 10 Girls and Women for light machine or hand processes and for the handling and packing of manufactured goods

It is not necessary to present at length here the manufacture of many or all kinds of findings. Some of them, especially toe boxes, heels, counters, and sole leather parts, have been fully treated in this volume, in earlier chapters. Most of the findings are closely related to other industries, and some are scarcely more than by-products of other kinds of manufacture. The making and preparation of fabric parts and lacings, for example, are associated with the textile industry, and the manufacture of repair tools belongs to the machine tool industry. Shoe brushes come from the brush factory, and fibreboard from the paper mill. Rubber heels are made in the rubber factory, and shoe thread in the thread mill. Wooden foot forms are supplied by the last maker. Shoe buttons are manufactured in the button factory. The United Shoe Machinery Corporation, which supplies machinery and repair parts to approximately 95 per cent of the shoe factories of the country, manufactures wire nails, tacks, and pegs in special small factories and supplies a large part of the trade in these articles.

The Making of the Shoe Shank. As an example of the

development and manufacture of one of the most important kinds of shoe findings the shoe shank is here treated at length. Primarily the shank of the shoe in the part of the sole between the heel and the ball of the shoe. In shoemaking the shank is a reinforcement placed between the outer and inner soles in that part. Its purpose is to give shape or style and elasticity to the shoe.

Fifty years ago the shoemaker used hard scraps of leather for shoe shanks, trimmed by hand to the desired shape. Thin pieces of wood, molded to shape on primitive machines, soon came into use, and later strips of hand pressed leatherboard. From 1877 to 1885 a single firm in this country had a monopoly of the manufacture and sale of molded shanks. About the year 1885 numerous patents were granted on shanks and on machinery for producing them. One form was a strip of flexible steel with leatherboard cover or casing. All these and other kinds of shanks are now in use according to the kind of shoe to be manufactured. There is, however, a constant tendency to use the kinds of better quality, as shoes sell and wear better with the more durable shank reinforcement.

The use of prepared shanks is universal and the world's supply is produced mainly in this country.

The making of a kind of shank now in very general use may be fully described here. It is the

wood or fibreboard shank, which itself has a steel reinforcement to maintain its shape permanently. Its manufacture falls into the three lines of wood, fibreboard, and steel work, each of which is usually done in a separate factory.

The wood part or base is manufactured by the following processes:

First, the wood is stripped from logs, upon a great lathe, in rolls about an eight of an inch thick and as wide as the shank is to be long. This work requires the full strength of an able-bodied man. Second, the rolls are fed endwise into a cutting machine, which cuts off strips of the width required for shanks. This work may be done by girls or women seated.

The wooden pieces are then sorted and made ready to receive the steel reinforcement.

The fibreboard base is treated as follows:

First, the fibreboard sheet is cut into strips, corresponding to the wooden rolls, as wide as the shank is to be long. This is done on a machine, the operator standing, and requires ability to move about freely.

Second, these strips are fed into a cutting machine, and made into individual shank pieces, ready tor reinforcement. This

work is done by girls and women seated.

The work on the steel reinforcement, which is the most difficult and important of all, is as follows:

First, the strips, or " ribbons," of steel plate, which comes from the fabricating steel mill, are fed into a heavy machine which cuts off pieces for the reinforcement, punches holes in the ends for attaching

to the wood or fibreboard shank, and bends or molds them into shape. Second, the reinforcing pieces are placed in a tempering furnace, where they are tempered to the right degree of flexibility.

The operators in these two processes are essentially steel workers, and must have good training and ability.

Finally the parts are brought together in the shank factory and the steel reinforcement is attached to the wood or fibreboard shank by tacks or nails through each end. This work is done by girls or women.

The processes may be shown by diagram in the following manner:

DIAGRAM SHOWING MANUFACTURE OF REINFORCED SHANK

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CHAPTER XVII

AN EXPLANATION OF THE TERMS USED IN SHOEMAKING

The Need of Knowing These Terms. For an intelligent reading or study of factory departments and processes it will be found necessary to know the meaning of the chief technical terms used in connection with leather and shoe manufacture. An explanation of a process in popular language only would prevent an exact and clear understanding of its nature. It is well to describe industry to one who wishes to enter it, either temporarily or as a life occupation in such a way as to show it in its real setting and

to use " shop language " as far as may be necessary to a right presentation of it. One should, if possible, see a machine in operation and hear the workman who operates it explain the working of the machine. The language of the trade is simple but expressive, and not at all difficult to understand. Throughout the pages of this book processes and machines are spoken of in technical terms and explained in popular language, so as to give the reader who may not be able to visit the factory an accurate and helpful picture of modern

shoemaking. Terms relating mainly to leather are given in Chapter V on Leather. Herewith, in Chapter XVII, is presented an explanation of the more common terms used in shoemaking.

Acid-Tanned. Tanned by a mineral acid, instead of by a vegetable substance such as the bark of certain trees and plants.

Adjustment. The fastening by which the shoe is adjusted to the foot, such as button, strap and buckle, webbing or lacing.

Aloft. (See " Stitched Aloft.")

Anatomic. Referring to the conformity of the shoe to the natural shape of the foot.

Arch. The bony framework of the foot between the heel and

the toes. The " broken arch " is a settling of this part of the foot due to a yielding of the muscles and ligaments. An " arch-support " is a mechanical contrivance placed in the shoe beneath the arch of the foot to keep it in its natural position. The term arch is used also for the corresponding portion of the shoe bottom.

Assembling. Putting together the various parts of the

shoe as they come from separate departments of the

factory. It includes the tacking of the inner sole to

the last, inserting the toe box and counter of the shoe,

1 and putting the upper part of the shoe on the last.

Backstay. A strip of leather covering and strengthening the back seam of a shoe on the outside.

Back Strap. The strap or loop by which the.shoe is pulled on the foot.

Bal. An abbreviation of Balmoral, the original English

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name for the shoe. A front-laced shoe of medium

height, as distinguished from shoes adjusted by other

fastenings, and also from other patterns of shoes, such

as Blucher or Oxford. Ball. The fleshy part of the foot back of the toes, or

the corresponding part of the shoe or of the last. Beading. Folding in the skived edges of the upper

leather; or making an impression by a wheel around

the sole of the shoe above the heel. Frequently called

" seat wheeling." Sometimes referring to the beads

placed on the vamps of women's slippers. Beating Out. The term used for leveling the bottom

of the shoe. Bellows Tongue. A wide folding tongue sewed to the

sides of the top for the purpose of making it water

tight, as in the case of heavy shoes for working or

tramping. Belting. That part of bark tanned cowhide, rubber, or

canvas used for machinery belts. Bench-Made.' Applying to shoes made by hand at the

cobbler's bench. Bend. The main or best portion of a side of leather. Blackball. A mixture of grease and lamp-black used

by hand shoe workers to polish the edges of soles

and heels.

Blacking the Edge. Dyeing the edge of the sole or

welt after the shoe has passed through the making

1 room.

Blind Eyelet. An eyelet inserted on the inner side of the eyelet facing, the hole on the outer side being left raw-edged.

Blocking. The cutting of a sole into rough or approximate shape, suitable for rounding. Also cutting top

or vamp into form suitable for the use of the pattern.

Blucher. The name of a high shoe or half boot originated by Field Marshall Blucher of the Prussian Army in the time of the first Napoleon. Its distinguishing feature is the extension of the quarters forward to lace across the tongue. The name now applies to any shoe having this extension.

Boot. A term usually and properly restricted to high-cut foot wear with tongue of firm leather, and sometimes laced, as in hunting boots. Formerly high footwear with no fastening. Often restricted to women's high-cut shoes.

Bottom Filling. The filler for the low space in the bottom, between outer and inner sole, in the fore part of the shoe, as ground cork or tarred felt.

Bottoming Finishing. The final polishing, buffing, and other processes applied to the bottom of a completed shoe.

Bottoming Scouring. Sandpapering the parts of the sole in front of the heel.

Box. A reinforcement placed in the toe of a shoe to preserve its shape, made of leather, leatherboard, canvas stiffened with glue or shellac, or other material. Called also " box toe."

Brogan. A heavy pegged or nailed work shoe of medium height.

Broken Arch. (See Arch).

Brushing. Finishing the edge, heel, or bottom with a polishing brush.

Buckram. Canvas stiffened with glue and used as a toe box or as a backing for shoe fabrics.

Buffing. Scouring off the outer grain side of leather. See bottom scouring.

Button. The use of the button as a shoe fastening is of quite recent date, having increased very rapidly since about 1907. At the present time women's shoes are about one-half of the buttoned type. The latest tendency is to seek ornamental effects through the use of special materials for shoe buttons.

Button Fly. The strip of leather in the front of the top of a button shoe having the button holes.

Cabaretta. A tanned sheepskin of superior quality and finish.

Calfskin. Skins of neat cattle / up to fifteen pounds weight. For trade convenience such are called " calfskin," those weighing from fifteen to twenty-five pounds, " kips," and all above twenty-five pounds are called hides. Calfskin makes a strong pliable leather highly susceptible to polish and to a dull, velvet or " Suede " finish, or to a patent leather finish. It has long been in use for all kinds of shoes.

Calking Machine. An appliance to shape the inner sole of a shoe in conformity with the bottom of the foot.

Carton. The pasteboard box in which each pair of shoes is packed. A comparatively late development in the trade. Formerly pairs of shoes were fastened together with strings at the heel; after that they were sometimes wrapped in pairs in ordinary paper. Standard sizes of cartons are now generally used, for convenience in packing in cases and for uniformity in size when the cartons are placed upon shelves in the shoe store.

Case. The box in which shoes are packed for shipment. Men's shoes are usually packed twelve pairs in a case; women's, twenty-four to thirty-six pairs.

Channel. A slanting cut around the edge of the sole for convenience in stitching the top to the bottom of the shoe. The lip of the channel or the raised portion is cemented

down after the stitching so as to preserve the stitch from immediate wear. Channeling means preparing the channel for the stitch.

Channel Screwed. The bottom held to the upper by wire screws fastening in the channel.

Channel Stitched. The soles fastened to the uppers by stitches which are concealed in the channel.

Channel Turning. Raising the lip of sole leather, or channel, so that the stitching can be done beneath it.

Chrome-tanned. Tanned by the use of bichromate of potash and muriatic acid.

Clicking. Cutting the uppers of shoes by a machine.

Closing On. Stitching the lining and outside together at the top, wrong side out.

Collar. A narrow strip of leather stitched around the outside of the shoe at the top.

Colonial. A woman's low shoe with wide tongue and ornamental buckle.

Combination Last. One having an instep of different width from that of the ball. Also a last that will allow both low and high shoes to be made upon it.

Congress Gaiter. A shoe having rubber goring for adjustment at the ankles.

Copper Toe. A copper outer boxing to protect the toe in children's shoes.

Counter. The stiffening in the back or heel part of a shoe to support the heel and prevent the shoe from running over, usually made of leather, leatherboard, felt, or canvas stiffened with shellac or paste.

Cravenette. A proprietary name for a closely woven

cloth used in shoe uppers. Creasing Vamp. Making hollow grooves or wrinkles

across the front of the vamp. Crimping. Shaping any part of the upper to conform

to the last. Crop. A side of leather after the belly part has been

cut-off. Cushion Sole. An elastic or padded inner sole, usually

of felt. Custom-Made. Made by hand to special order and

measurement. Cut-off Vamp. One cut off at the tip and stitched to

the toe cap, not extending under the tip beyond the

tip stitching. Dieing or Dinking. Cutting soles or other parts of

the shoe with machine and die. Dom Pedro. A heavy single-buckle shoe with bellows

tongue, usually of a cheap grade. Dressing. A process for restoring the finish of the

upper. Also used for the materials for cleaning and

polishing the shoe. Edge Setting. Finishing and polishing the edge of the

shoe. Edge Trimming. Cutting the edge of the shoe smoothly

to conform to the shape of the last. Embossing. Stamping or carving figures and trademarks on leather. Eyelet. A small ring of metal set in the lacing hole.

The eyelet hole is sometimes worked with thread. Fabric. A general term for the cloths used in shoe-making.

Facing. The leather used around the top of the shoe and down the eyelet row, inside.

Fair Stitch. The stitching sometimes run around the edge of the sole to give the McKay the appearance of the welt.

Filler. A light, hollow, wooden form used to keep a shoe in shape. Called also " form."

Findings. The small parts or accessories of a shoe, practically everything except leather and lining, such as laces, polishes, cement, nails, brushes, thread, and numerous other incidental articles used in the making and care of shoes.

Finish. Polishing, buffing or other final treatment of the soles of shoes.

Fitting. The selection and adjustment of ready-made shoes to the foot of the wearer. In the old days of hand work, shoes were made to individual measurement. Such is still the case with the " custom shoe " where the added cost can be afforded. The factory-made shoe, of typical form, throws upon the salesman in the retail store the problem of fitting. Some adjustment can be provided by stretching the upper or by moving buttons, but it is chiefly a problem of right selection from standard patterns.

Fitting Room. The department of the factory in which the various parts of the upper of the shoe are stitched together, before going to the lasting room.

Form. (See heel). Used also for the bench of the hand shoemaker.

Foxing. That part of the upper extending from the sole to the lacing or adjustment in front, and to about the height of the counter in the back, being the full

length of the upper. More simply, the lower part of the quarter.

French Size Marking. A cipher or secret method of marking concealing from the customer the exact size of the shoe. Many varieties of this system are in use.

Gaiter. A term now applied mainly to a separate ankle covering.

Gem Insoles. A cloth-reinforced leather insole for welt shoes.

Golf Shoe. A low shoe with rubber sole used for out-door sports.

Goodyear Welt. The method of attaching the sole to the upper by the use of a narrow strip of leather called the welt.

Gore. A rubber elastic used on both sides for the adjustment of a Congress shoe.

Grading. The sorting of soles for uniform thickness in the

edges of finished shoes. Also selecting skins for shoes of different prices.

Half-Sole. Half of a complete sole used under the front part of the out sole.

Heel. The leather or other material attached to the back part of the sole, or " heel seat," to give a desired height above ground. The chief varieties are named after their style or shape. Their height is usually expressed in eighths of an inch. Heels are made in layers or lifts of leather, of wood, of leatherboard, and of substitutes for leather. The breast of the heel is its front face. The French heel is extremely high with a curved outline; the Cuban, high with straight outline; the military, like the Cuban but lowej:; the spring heel is very low and formed by inserting a slip of leather between the out sole and the heel seat,

so that the out sole forms the heel; the flange heel is made flaring toward the bottom. In women's fabric shoes heels are often covered with the same material as the upper. The " pitch " of a heel is its direction or inclination under the foot. Heels are attached to the heel seat by nails and cementing. The nails inside the shoe are covered by a small piece of felt or other substance called the heel pad.

Heel Scouring. Sandpapering the outside surface of the heel.

Heel Seat. The rounded part of the sole on which the heel is fastened. Heel seat nailing consists in nailing this part of the sole; heel seat trimming, smoothing this part.

Heel Shaving. Shaping the heel by shaving off the surplus leather.

Hemlock Tanned. Preserved by the use of hemlock bark.

Inseam Trimming. Cutting off surplus leather from the seam which fastens the upper to the bottom in the turn shoe and in the welt.

Insole. The inner sole of a sewed shoe, which is first placed upon the last. The inner soles are attached to both the upper and out sole.

Inspecting. Examining shoes for imperfections.

Ironing Uppers. Smoothing the upper with a hot iron.

Lace. A string of leather or fabric used in adjusting and holding the shoe to the foot.

Lace Stay. A strip of leather reinforcing the eyelet holes.

Lap Stone. An iron plate or stone upon which the cobbler beats sole leather or seams or folded edges with a flat faced hammer.

Last. The wooden or metal form upon which the shoe is constructed, and which gives the shoe its distinctive shape.

Lasting. Stretching the upper tightly over and making it conform to the last. Assembling and pulling over the parts of the upper on the last.

Leveling. Shaping the sole to the bottom of the last by the use of heavy rollers or molds.

Lift. A single thickness of the material used in the heel.

Lining. The inside part of the upper, made of fabric or of thin, light-weight leather.

Low cut. A general term applying to such low shoes as Oxford, pump, tie, colonial, slipper, and sandal.

McKay Sewed. A mode of shoemaking named after the inventor. After the upper is lasted upon the inner sole the last is removed and the outer sole is attached by a thread passing directly through the upper and inner sole. The out sole is generally channeled and the lining is put over the inner seam, on the inside of the shoe. This mode has lowered the cost of making medium-priced shoes. It is a less satisfactory mode than the welt process.

Measurement. Taking the dimensions of the foot for custom made shoes. The chief points of measurement are, the ball of the foot, the waist, the instep, ankle, and total length.

Moulding. Shaping the sole to conform to the bottom of the last.

Naumkeaging. Smoothing up the bottom of the shoe with fine sandpaper after buffing on coarse sandpaper.

Oak-Tanned. Preserved by means of oak bark. Regarded as the best tanning of sole leather.

Oxford. A low-cut shoe in lace, strap, or button, made

in men's, women's, and children's sizes. This style

is said to have been first worn in Oxford, England,

over three hundred years ago. Pasted Counter. Made of two pieces of sole leather

pasted together. __

Pattern. Metal or cardboard model of form by which

any part of the shoe upper is cut. Pegging. Attaching the outer sole with pegs. Perforating. Making decorative holes around upper

parts. Also the term for the work done on the edges

of the upper after skiving and folding. Polish. Ladies' and

misses' front-laced, high-cut shoe,

originated in Poland. Pressing. Applying a flat-press to heels and soles. Pulling Lasts. Removing lasts from shoes. Pulling Over. Drawing the upper over the last and

tacking it into position. Pump. A shoe cut below the instep and having no

fastening. Quarter. The rear part of the upper when a full vamp

is not used. Rand. A strip of sole leather made thin on one edge

and placed around between the heel and the sole, to

fill empty space and balance the heel. Relasting. Putting lasts in shoes from which the

original lasts have been drawn. Repairing. Filling cracks in patent leather on the

finished shoe. Any cobbling work. Rolling. Passing leather between rolls to make it firm

and durable. Also, polishing shoe bottoms on a roll

bearing a brush.

Rough Rounding. Shaping the outsole to the last, and channeling also in the welt-channeled shoe. One of the hardest of processes.

Royalties. Sums based on production paid by shoe manufacturers for the use of machines when hired of the machine companies or for protected processes.

Rubber Cement. A powerful, quick-drying solution of rubber, often used in leather shoemaking and shoe repairing.

Rubber Shoes. Footwear in considerable variety from the sandal to the hip length boot. The low rubber overshoe is the most common. Rubber footwear consists of fabric coated with rubber. Rubber heels and soles are used more and more on shoes of leather or fabric tops.

Sample. In the shoe trade a single shoe to show the character of an entire lot. As a rule samples are made up by factories twice a year, in the spring and fall, and carried by the traveling salesmen on their routes. Shoes are then made in the factory from the orders received upon each sample.

Sandal. A woman's or child's strap slipper.

Screw Fastened. Having the bottom attached to the upper with wire screw nails, as in some heavy shoes.

Shank. A strip of metal or other material used between the inner and outer sole, between the heel and the ball, to stiffen

the sole of the shoe. Also, this part of the shoe.

Shank Burnishing. Polishing the black shank part of the shoe with a hot iron. Shanks are finished in black or in colors.

Shanking Out. Thinning and smoothing the shank part of the shoe.

Size. The length measure of the shoe on standard widths. The length is expressed by numbers or the French cipher and the widths by letters. American and English sizes vary by one-third of an inch. The American size system runs from o to 13^, and then starts over again at 1." The infants' size runs from o to 5; children's from 5 to 11; misses', 11^ to 13^ and then to 2 in the second series; women's, from i\ to 8; little men's from 8 to 13^; youths', from 1 to 2; boys', from 2^ to si} an d men's from 6 to 12. Larger sizes* are made on special orders.

Skiving. Cutting sole leather to a uniform thickness. Shaving upper leather, especially, to a thin edge, in the cutting or stitching department.

Slipper. A name for low footwear, other than rubber, without special means of fastening to the foot.

Slugging. Driving slugs, or short nails, in heels.

Sneaker. A rubber-soled canvas shoe for out-door wear.

Sock Lining. The lining which covers the McKay insole.

Soft Tips. Having no box toe under the tip.

Spies and Sole Leather. The pieces of heavy leather, mainly, from neat animals and used in the soles of shoes.

Sole Laying. The preliminary process of attaching the out-sole in position for stitching, nailing, or pegging.

Sorting. The process of arranging out-soles or upper leather by grades.

Spat. An English term for Gaiter.

Split. A layer of a hide which has been cut into thicknesses.

Spring. The deviation from a straight line at the toe or arch of a shoe.

Stamping. Putting size and width on the inside of the

shoe, or the name on the bottom, or marks on the carton.

Stay. A piece of leather used to strengthen a part or seam.

Stitch Separating. Marking indentations between stitches to make the stitching conspicuous.

Stitched Aloft. Sewed without channeling, so that the stitches show on the bottom. The name comes from the manner of the holding of the shoe in the process,

• bottom up.

Stock Keeping. Caring for stock in storage, following sales, and keeping a supply on hand. The manufacturer must know how his styles are selling and how large his supply must be to keep ahead of his trade. Accurate and proper stock keeping is very important in shoe manufacture.

Stripping. Cutting hides into strips wide enough to make soles of a desired size.

Style. The shape, model, or material determined by standards in use or in fashion, or by forms which manufacturers desire to put upon the market. A particular pattern or design, applying to the shoe as a whole or to any part which may be given special distinction.

Tan. From the Norman-French word for oak bark. A yellowish brown color given by the bark used in tanning, finished without applying special colors.

Tanning. Converting hides and skins into leather by astringent acids or mineral substances.

Tap. An outer half sole.

Tempering. Softening leather in water.

Tip. The toe piece stitched to the outside of the vamp.

Often of different leather than that of the rest of the

shoe, as " patent tip." Tongue. A narrow piece of leather placed beneath the

lacing or other fastening of a shoe. Top. The part of the upper above the vamp. Top Facing. The leather or band of cloth around the

inside of the shoe top. Top Lift. The outer piece of leather in the heel. Top Stitching. Sewing across the top and down the side. Treeing. Shaping the shoe ; smoothing it in the treeing

room. Trimming Cutting. Cutting stays, facings, and other

small parts of the shoe upper. Turned Shoe. A woman's fine shoe, of flexible sole,

with upper stitched to the sole wrong side out, the

shoe being then turned right side out. One of the

three chief methods of shoemaking at the present time. Turnover. The gross amount of sales in comparison

with the gross amount of stock. Upper. A collective term for the parts above the sole

and heel of a shoe. Vamp. The front or lower part of the upper. A

" cut-off" vamp extends only to the tip. A " whole

vamp " extends to heel without a seam. The vamp

is the most important part of the upper and should

be of the best leather. Vamping. Sewing the vamps to the top. Viscolizing. A patent method- of making sole leather

waterproof by treating it with oil emulsions. Welt. A narrow strip of leather sewed to the upper and

insole, having the edge of the welt extending outward

so that the outsole can be attached by sewing through

welt and outsole around the outside. This is the

most modern and best method of shoemaking. " Goodyear Welt" is a welt sewed by the Goodyear welting machine.

The three chief kinds of sewed shoes, from methods used in making, are the welt, the McKay, and the turned shoe.

Welt Beating. Flattening out the welt, after sewing.

Welting. The material used for the welt. Also sewing the welt to the shoe.

Wheeling. Running a corrugated wheel around the edge or bottom of a shoe, to give finish or to imitate stitching.

Width. More properly the girth of the ball, waist, and instep of the foot or last. Widths vary in quarter inches of these measurements from " double narrow " to " double wide," through the series of sizes.

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